HITACHI
SERVICE MANUAL

TK No. 2464E

VM-5000A

VM-5000A

Technical Data

VHS

THIS VIDEO DECK IS A VHS TYPE VIDEO RECORDER.
FOR PROPER OPERATION, ONLY THE VHS TYPE CASSETTE MUST BE USED.

SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi replacement parts. Especially critical parts in the power circuit block should not be replaced with other makers!
   Critical parts are marked with ⚠ in the schematic diagram .
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

X-RAY RADIATION

The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in this viewfinder is especially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be the same type as the original, Hitachi approved one.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CAMERA/RECORDER

June 1986 TOKAI WORKS

VM-5000A

CONTENTS

SPECIFICATIONS 3
INDENTIFICATION AND OPERATION OF CONTROLS 4
CIRCUIT BOARD LOCATION 7

DISASSEMBLY

CASE
Electronic Viewfinder (EVF) Removal 9
Electronic Viewfinder (EVF) Shoe Removal 9
Accessory Shoe Removal 9
Cassette Lid Removal 9
Left Case Removal 9
Grip Cover Removal 10
Right Case Removal 10
Tape Transport Mechanism Identification – Top View 11
Tape Transport Mechanism Identification – Bottom View 12

CIRCUIT BOARD
Function Switch Circuit Board Removal 13
Main Circuit Board Removal 13
Audio Circuit Board Removal 14
Process Circuit Board Removal 14
Encoder Circuit Board (Zoom Switch Circuit Board and VTR REC Switch Circuit Board) Removal . . 15
Wiring Circuit Board Removal 16
Control Circuit Board Removal 16
Sensor Circuit Board Removal 17
Regulator Circuit Board Removal 18
EVF Connector Removal 18

TAPE TRANSPORT MECHANISM
Tape Transport Mechanism Removal 19
Cassette Holder Removal 19
Video Head (Upper Cylinder) Removal 20
Audio/Control (A/C) Head Removal 20
Full Erase (FE) Head Removal 21
Supply End Sensor Removal 21
Take-up End Sensor Removal 22
Take-up Reel Sensor Removal 22
Dew Sensor Removal 23
Cassette Holder Switch Removal 23
Safety Tab Switch Removal 23
Mechanism State Switch Removal 24
End Lamp Removal 24
Lower Cylinder (Cylinder Motor Assembly) Removal 25
Capstan Motor Removal 25
Loading Motor Removal 26
Catcher Block Removal 27
Impedance Roller Removal 27
Pressure Roller Arm Removal 27
Tension Arm and Tension Band Removal 27
Take-up Sub Brake Removal 28
Supply Sub Brake Removal 28
Take-up Reel Disk Removal 28
Supply Reel Disk Removal 29
Guide Post (1) and Guide Post (2) Removal 29
A/C Head Base Removal 29
Guide Arm Assembly Removal 29
Supply Guide Roller and Take-up Guide Roller Removal 30
Cam Gear Plate Removal 30
Capstan Flywheel Removal 30
A/C Head Control Arm Removal 30
PB/REC Drive Arm Removal 31
Cam Gear Arms (1) and (2) Removal 31
Supply and Take-up Loading Cam Gears Removal . . 31
Guide Roller Base Removal 32
Slider Removal 32
Reel Gear Block Removal 32
Main Brake Arm Removal 32
Damper Removal 33
Up Slider Removal 33
Quick Slider and Supply Reel Sensor Removal 33

LENS BLOCK
Lens Block Removal 34
Autofocus Circuit Board Removal 35
Zoom Motor Removal 36
Focus Motor Removal 36
Focus Switch Removal 37
Iris Block Removal 37

ELECTRONIC VIEWFINDER (EVF)
Bottom Cover Removal 38
Electronic Viewfinder (EVF) Circuit Board Removal 38
Mic Jack Circuit Board Removal 38
CRT Removal 38

ADJUSTMENT
SERVICING JIG AND TOOLS 40

MECHANISM ADJUSTMENT
MECHANISM STATE SWITCH ADJUSTMENT . . . 41
Loading Cam Gear 41
Mechanism State Switch Adjustment 41
TAPE TRANSPORT MECHANISM SYSTEM COMPONENT CHECK/ADJUSTMENT 42
Reel Disk Height Adjustment 42
Tension Pole Position/Tension Adjustment 42
Impedance Roller Height Adjustment 43
Guide Pole Height Adjustment 43
Guide Roller Height Adjustment 43
A/C Head Adjustment 44
Adjustment After Replacing Cylinder 46
TENSION AND TORQUE CHECKS 46

ELECTRICAL ADJUSTMENT 48

The table of contents for adjustment is given in detail on page 48.

SCHEMATIC DIAGRAMS AND CIRCUIT BOARD DIAGRAMS CONTENTS

CIRCUIT BOARD CONNECTION DIAGRAM
- ELECTRONIC VIEWFINDER 74
- AUTO FOCUS 74
- CAMERA 75
- VTR 77

SENSOR
- SCHEMATIC DIAGRAM 79
- CIRCUIT BOARD DIAGRAM 85
- WAVEFORMS 81

PROCESS
- SCHEMATIC DIAGRAM
  - CHROMA FILTER 87
  - PROCESS 89
- CIRCUIT BOARD DIAGRAM 97
- WAVEFORMS 91

ENCODER
- SCHEMATIC DIAGRAM 100
- CIRCUIT BOARD DIAGRAM 107
- WAVEFORMS 103

WIRING · CONTROL · REGULATOR
- SCHEMATIC DIAGRAM
  - WIRING 110
  - REGULATOR 111
  - CONTROL 111
- CIRCUIT BOARD DIAGRAM
  - WIRING 113
  - REGULATOR 115
  - CONTROL 112

MIC JACK
- SCHEMATIC DIAGRAM 116
- CIRCUIT BOARD DIAGRAM 116

ELECTRONIC VIEWFINDER
- SCHEMATIC DIAGRAM 117
- CIRCUIT BOARD DIAGRAM
  - ELECTRONIC VIEWFINDER 119
- WAVEFORMS 121

AUTO FOCUS
- SCHEMATIC DIAGRAM
  - AUTO FOCUS 123
- CIRCUIT BOARD DIAGRAM
  - AUTO FOCUS 125

MAIN
- SCHEMATIC DIAGRAM
  - SYSTEM CONTROL 126
  - SWITCHING REGULATOR 129
  - CYL.–/CAPST.–MOTORS DRIVE 130
  - SERVO 131
  - HEAD SW/LUMA 139
  - CHROMA 141
- CIRCUIT BOARD DIAGRAM 153
- WAVEFORMS
  - SERVO 133
  - LUMA/CHROMA 143

FUNCTION SW
- SCHEMATIC DIAGRAM 156
- CIRCUIT BOARD DIAGRAM 157

AUDIO
- SCHEMATIC DIAGRAM
  - AUDIO 159
  - TROUBLE SENSOR 162
- CIRCUIT BOARD DIAGRAM
  - AUDIO 160
  - END LAMP 163
  - TAKE-UP END SENSOR 163
  - SUPPLY END SENSOR 163
  - SAFETY TAB SW 163
  - CASSETTE HOLDER SW 163
  - TAKE-UP REEL SENSOR 164
  - SUPPLY REEL SENSOR 164

EXPLODED VIEW
- CABINET SECTION 165
- CHASSIS (UPPER) SECTION 167
- CHASSIS (LOWER) SECTION 169
- ELECTRONIC VIEW FINDER SECTION 171
- LENS SECTION 172
- LUBRICATION 173

REPLACEMENT PARTS LIST 174

SPECIFICATIONS

General	
Power requirements	12V DC
Power consumption	9.5 watts (nominal)
Dimensions	6-7/16"(W) x 7-9/16"(H) x 14-1/8"(D) 164(W) x 192(H) x 359(D) mm
Weight	5.5 lbs (2.5 kg)
Video Recorder Section	
Format	VHS
Record/playback system	Four video record/playback heads
Video signal	EIA standard NTSC color
Tape speed	33.35 mm/sec.
Video input	1.0 Vp-p, 75 ohm
Video output	1.0 Vp-p, 75 ohm
Audio input	–7.8 dBs (316 m Vrms), more than 47K ohms
Audio output:	–7.8 dBs (316 m Vrms), less than 1K ohm
Fast forward/rewind time	Less than 10 minutes with T-160 cassette
Camera Section	
Scanning	525 lines/60 fields/30 frames
Required minimum illumination	7 lux
Image Sensor	2/3" solid state MOS Imager
Lens diameter	52 mm

IDENTIFICATION AND OPERATION OF CONTROLS

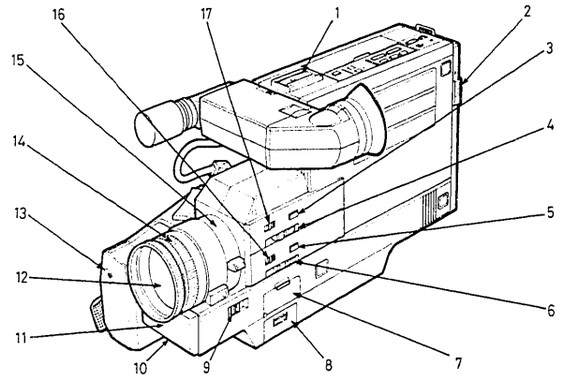


Fig. 1-1

1. **Accessory Shoe**
   Used to attach the Carrying Handle (Accessory No. 3) or Camera Light.
2. **"BATT EJECT" Lever**
   Releases the Battery or the AC Adaptor/ Charger attached to the Video Camera/ Recorder.
3. **"REVIEW" Button**
   Used to review the last few seconds of recorded segment in the record/pause mode.
4. **Manual White Balance Control**
   Use this control to adjust the color balance manually. Set the "WHITE BAL" Switch to "MANUAL", and while viewing color monitor, adjust this control for a nature picture.
5. **"TIME/DATE" Button**
   Operate this button to record the date and time superimposed on the picture being shot.
6. **Manual Iris Control**
   Set "AUTO/MANUAL IRIS" Switch to "MANUAL" position and then slide this control to the right or left for manual iris controlling.
7. **Time/Date Set Buttons (behind door)**
   The Buttons behind the door let you set the Camera/Recorder's internal clock for the correct date and time.
8. **Battery Compartment**
   With two batteries installed, the Camera/ Recorder will "remember" the correct day and time for approximately one year. (See page xx for battery installation procedure.)
9. **"AUTO/MANUAL FOCUS" Switch**
   Set this Switch to the "AUTO" position for automatic focusing, and to the "MANUAL" position for focusing with the Focus Ring. When the Switch is pushed inwards while in the "MANUAL" position, automatic focusing is performed until the Switch is released.
10. **Lens Cap Holder**
    Place the Lens Cap in this holder when you ready to record a scene. The holder also prevents the Lens Cap from swinging around on its cord.
11. **Auto Focus Window**
    To automatically focus the camera lens, this window transmits and receives infrared light which is reflected off the subject. Make sure you don't obstruct this window when recording.
12. **Lens**
    F1.2 (11.5 ~ 69 mm) 6:1 power zoom lens features auto focus and auto iris functions.
13. **White Balance Detection Window**
    Detects the white balance signal. For proper white balance operation, do not block the window with your hand or another object.
14. **Focus Ring**
    Do not attempt to manually turn the Focus Ring when the Camera/Recorder is in the AUTO FOCUS mode.
15. **Zoom Ring (Manual Zooming)**
    The picture size can be magnified 6 times with the use of the zoom feature. Just rotate the Zoom Ring for a close up (T) or wide angle (W) picture. Macro close-up, as close as 1 cm from object, is feasible.
16. **"AUTO/MANUAL IRIS" Switch**
    When this Switch is in the "AUTO" position, the iris is controlled automatically. Set the Switch to "MANUAL" position to control the iris manually by moving "MANUAL IRIS" Control.
17. **"WHITE BAL"ance Switch**
    When this Switch is in the "AUTO" position, the color balance is set automatically. Place the Switch in "MANUAL" position to adjust the color balance to suit your personal preference.

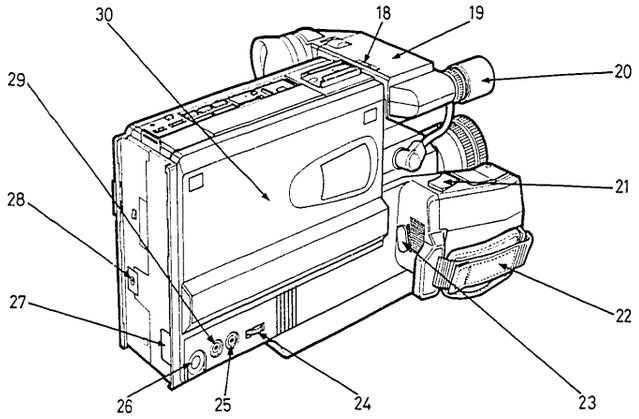


Fig. 1-2

18. **"LOCK/RELEASE" Switch**
Slide the Lever to "RELEASE" position. Used to adjust the eyepiece position of Electronic Viewfinder (EVF).

19. **Electronic Viewfinder (EVF)**
Displays what the Camera/Recorder lens sees. The electronic viewfinder also functions as a convenient black-and-white monitor during playback of recorded material.

20. **Microphone**
Sensitive to sounds coming from the direction in which the camera is pointed. Detachable with fastening ring.

21. **Power Zoom Switch**
This switch performs zooming electrically. "W": Picture becomes wider gradually. "T": Picture becomes telescopic gradually.

22. **Hand Strap**
Adjust to best fit to your hand.

23. **Record Start/Stop Button**
This Button is used to control the Camera/Recorder. When this Button is pressed with the Camera/Recorder set to the recording mode, the tape runs to start recording. When this Button is pressed again, the tape stops and the Camera/Recorder enters the record/pause (standby) mode.

24. **"TRACKING" Control**
Used when playing a tape recorded on another VTR. Adjust for best picture. At all other times leave it in the center position, when can be found as a small detent in the movement of the knob.

25. **"REC/PAUSE" Jack**
Recording and pausing may be remotely controlled by a wired Remote Pause Cable with switch (Optional accessory).

26. **"A/V OUT" Jack**
Connect the Audio/Video Output Cable to this jack and to the audio and video inputs of your TV/monitor receiver. You may also connect the RF Converter-Unit to this jack and your TV receiver.

27. **Power Terminal Protection Cover**
This Cover should be in the uppermost position covering the terminal at all times.

28. **"DC IN-12V" Jack**
Used for the optional Car Battery Cord which connects to the cigarette lighter socket in your car.

29. **"EAR" phone Jack**
Sound being recorded by the microphone or played back may be monitored by attaching earphone to this jack.

30. **Cassette Holder**
Press "EJECT" Button to open the Cassette Holder. Be aware of the Cassette direction when inserting.
Note: Power source must be connected to open the Cassette Holder.

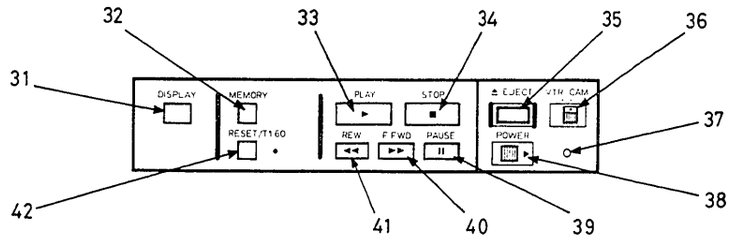


Fig. 1-3

31. **"DISPLAY" Button**
Pressing this Button once causes a 4-digit tape counter and battery indicator display to appear in the Camera/Recorder's electronic viewfinder. Press again to display the battery indicator and the amount of time remaining on the cassette in the Camera/Recorder. Press a third time to delete all displays.

32. **"MEMORY" Button**
This Button lets you index any place on a tape so that the Camera/Recorder will stop at that point during fast forward or rewind. When this Button is activated, the letter "M" will appear next to the counter or time remaining display in the viewfinder. With the memory function active, the Camera/Recorder will stop rewind or fast forward operation when the tape counter reaches 0000.

33. **"PLAY" Button**
Used for playback of tape recorded in SP mode.

34. **"STOP" Button**
The "STOP" Button is used to stop playback, rewind, and fast forward operations. The "STOP" Button has no effect during record operation.

35. **"EJECT" Button**
Operates with "POWER" either on or off.

36. **"VTR/CAMERA" Select Switch**
This Switch changes the Camera/Recorder to the record mode or to the playback mode. The Switch must be in "CAMERA" position for recording.

37. **"POWER"/Dew Indicator Light**
Flashing of the Light indicates dew condensation on Camera/Recorder mechanism. While this Light is flashing, the unit will not operate. If this occurs, eject the tape and leave the power on. When the Light stops flashing, the unit can be operated.

38. **"POWER" ON/OFF Switch**
Slide "POWER" ON/OFF Switch to turn Camera/Recorder on. Slide again to turn Camera/Recorder off.
"POWER" Light illuminates when "POWER" ON/OFF Switch is slide and Camera/Recorder is on.

39. **"PAUSE" Button**
Press this Button during playback to display a still picture on the viewfinder.

40. **"F. FWD" Button**
Press this Button during Stop or Rewind mode, and fast-forwarding starts.
Press the Button during playback of tape, and the tape is played back in the forward direction approximately 3 times faster than the normal speed to confirm the recorded content. Press "PLAY" Button to return to normal playback mode or press "STOP" Button to stop tape movement.

41. **"REWIND" Button**
Press this Button during Stop or Fast forward mode, and fast-rewinding starts. Press the Button during playback of tape, and the tape is played back in the rewind direction approximately 3 times faster than the normal speed to confirm the recorded contents. Press "PLAY" Button to return to normal playback mode or press "STOP" Button to stop tape movement.

42. **"RESET/T160" Button**
When the tape counter is displayed in the viewfinder, pressing this Button resets the counter to 0000. When the time remaining read-out is displayed, pressing this Button adapts the display for extended length T-160 (2 Hr., 40 Min.) tapes. The light beside this Button glows when the Camera/Recorder is in T-160 tape mode.

CIRCUIT BOARD LOCATIONS

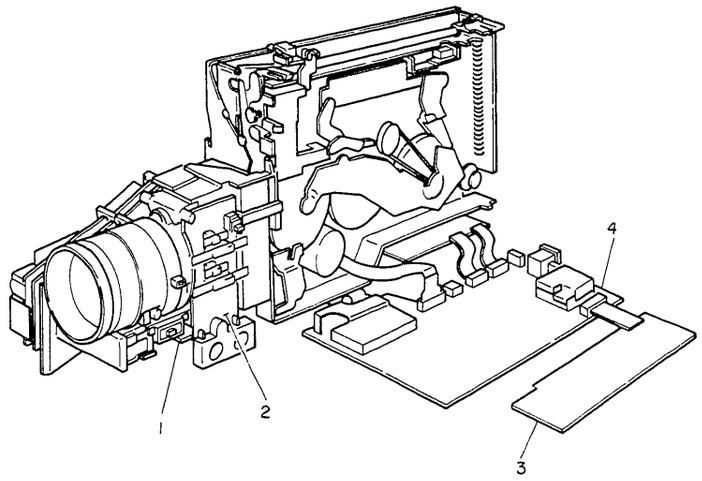


Fig. 1-4

1. Autofocus Circuit Board
2. Control Circuit Board
3. Function Switch Circuit Board
4. Main Circuit Board

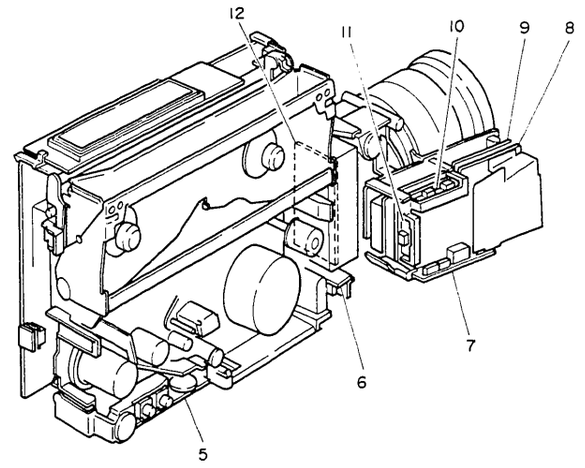


Fig. 1-5

5. Audio Circuit Board
6. Regulator Circuit Board
7. Wiring Circuit Board
8. Encoder Circuit Board
9. Process Circuit Board
10. Zoom Switch Circuit Board
11. VTR REC Switch Circuit Board
12. Sensor Circuit Board

DISASSEMBLY

CASE

Electronic Viewfinder (EVF) Removal (Fig. 2-1)

1. Disconnect EVF connector.
2. Release the EVF lock and remove the EVF in the direction of the arrow.

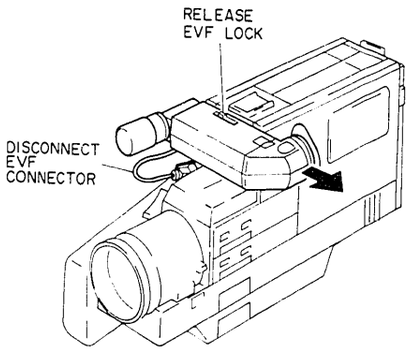


Fig. 2-1 Electronic Viewfinder (EVF) Removal

Electronic Viewfinder (EVF) Shoe Removal (Fig. 2-2)

1. Remove the EVF. (See Fig. 2-1)
2. Remove two (2) screws holding the EVF shoe. (See Fig. 2-2)

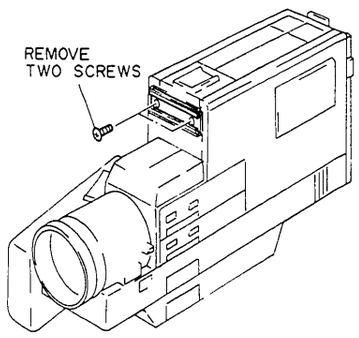


Fig. 2-2 Electronic Viewfinder (EVF) Shoe Removal

Accessory Shoe Removal (Fig. 2-3)

1. Remove two (2) screws holding the accessory shoe. (See Fig. 2-3)

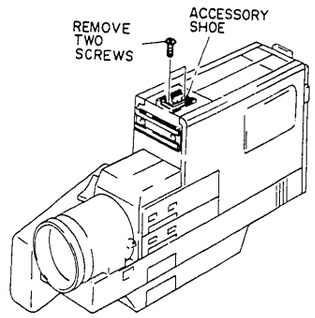


Fig. 2-3 Accessory Shoe Removal

Cassette Lid Removal (Fig. 2-4)

1. Remove two (2) gum caps masking the cassette lid holding screws. (See Fig. 2-4)
2. Remove two (2) screws holding the cassette lid.
3. Remove the cassette lid in the direction of the arrow.

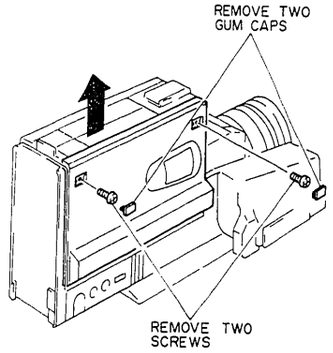


Fig. 2-4 Cassette Lid Removal

Left Case Removal (Fig. 2-5)

1. Remove the EVF. (See Fig. 2-1)
2. Remove eight (8) screws holding the left case. (See Fig. 2-5)
3. Remove the left case in the direction of the arrow.

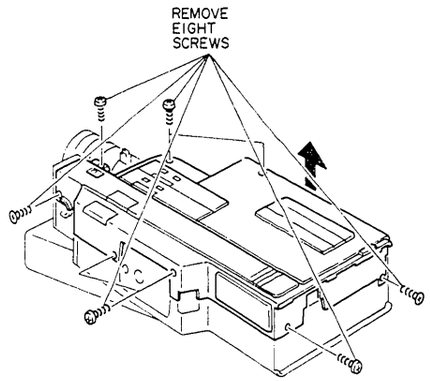


Fig. 2-5 Left Case Removal

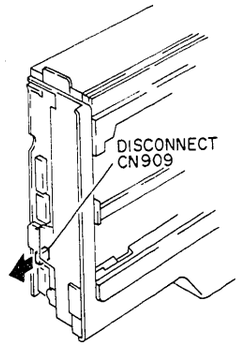


Fig. 2-7 Right Case Removal

Grip Cover Removal (Fig. 2-6)

1. Remove one (1) screw holding the adjustment cover. (See Fig. 2-6)
2. Remove the grip cover in the direction of the arrow.

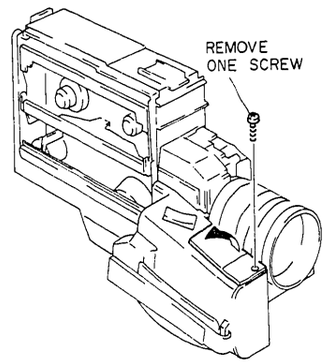


Fig. 2-6 Grip Cover Removal

Right Case Removal (Figs. 2-7, 2-8, 2-9)

1. Remove the EVF. (See Fig. 2-1)
2. Remove the EVF shoe. (See Fig. 2-2)
3. Remove the accessory shoe. (See Fig. 2-3)
4. Remove the cassette lid. (See Fig. 2-4)
5. Remove the left case. (See Fig. 2-5)
6. Remove the grip cover. (See Fig. 2-6)
7. Disconnect connector CN909. (See Fig. 2-7)
8. Remove two (2) screws holding the right case. (See Fig. 2-8)
9. Remove five (5) screws holding the right case. (See Fig. 2-9)
10. Release one (1) tab and remove the right case in the direction of the arrow.

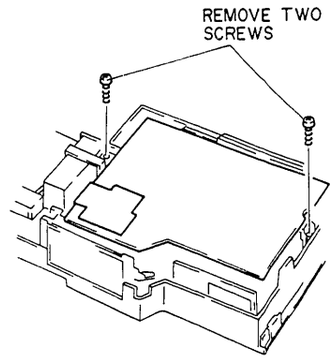


Fig. 2-8 Right Case Removal

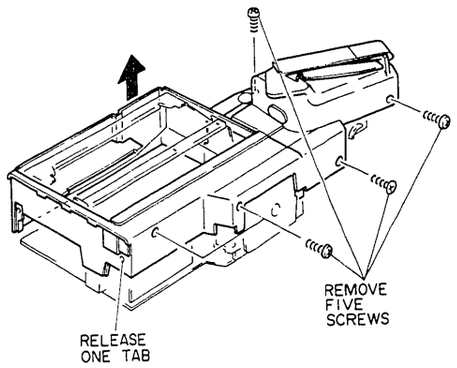


Fig. 2-9 Right Case Removal

TAPE TRANSPORT MECHANISM IDENTIFICATION

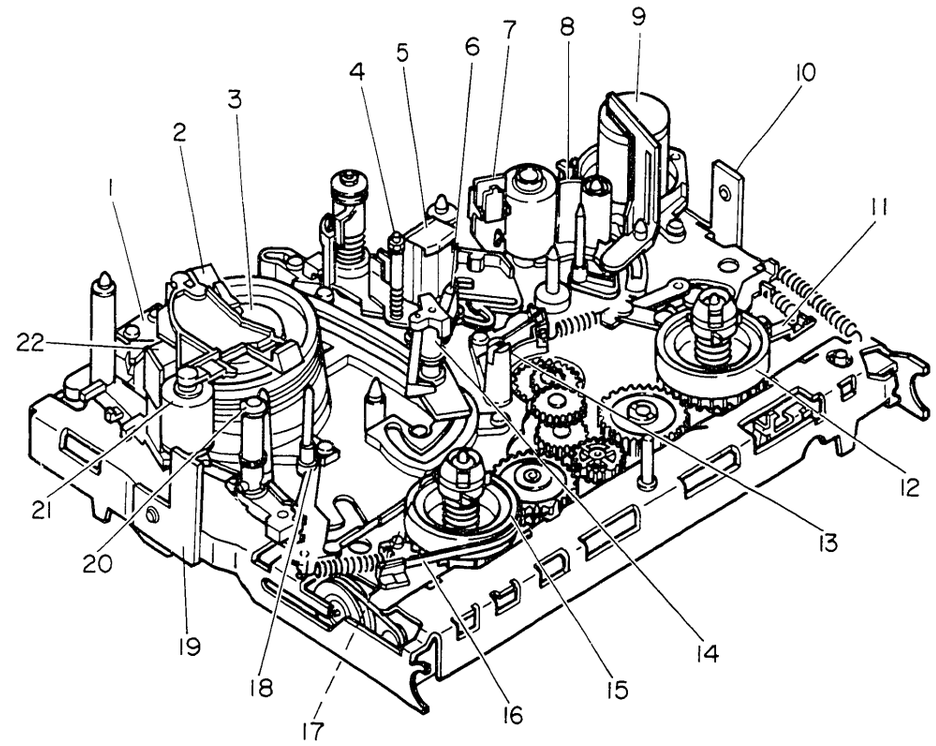


Fig. 2-10 Tape Transport Mechanism – Top View

1. Catcher Block
2. Static Discharge Brush
3. Upper Cylinder (Video Heads)
4. Guide Post
5. A/C (Audio/Control) Head
6. Guide Arm Assembly
7. Dew Sensor
8. Pressure Roller Arm
9. Capstan Motor
10. Take-up End Sensor
11. Take-up Sub Brake
12. Take-up Reel Disk
13. End Lamp
14. Take-up Guide Roller
15. Supply Reel Disk
16. Tension Band
17. Supply Sub Brake
18. Tension Arm
19. Supply End Sensor
20. Supply Guide Roller
21. Impedance Roller
22. Full Erase (FE) Head

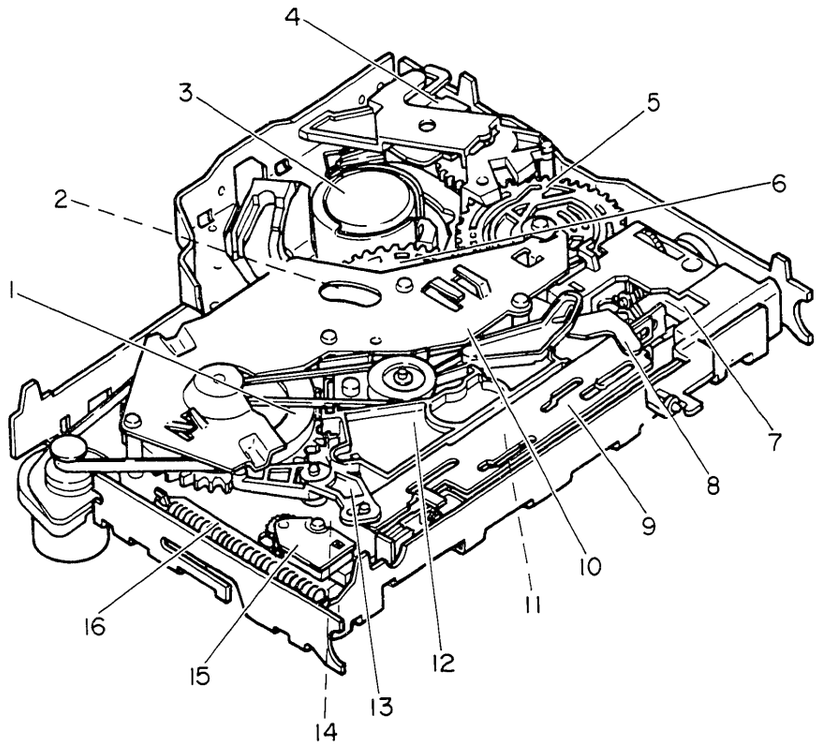


Fig. 2-11 Tape Transport Mechanism – Bottom View

1. Capstan Flywheel
2. A/C Head Control Arm
3. Lower Cylinder (Cylinder Motor)
4. Mechanism State Switch
5. Supply Loading Cam Gear
6. Take-up Loading Cam Gear
7. Loading Motor
8. Cam Gear Arm
9. Slider
10. Cam Gear Plate
11. Main Brake Arm
12. Reel Gear Block
13. PB/REC Drive Arm
14. Take-up Reel Sensor
15. Damper
16. Up Slider

CIRCUIT BOARD

Remove the right case and left case as previously given.

Function Switch Circuit Board Removal (Figs. 2-12, 2-13)

1. Release ten (10) wires from the wire holder. (See Fig. 2-12)
2. Release two (2) tabs holding the main circuit board.
3. Pull out the function switch circuit board in the direction of the arrow.
4. Open the main circuit board and function switch circuit board in the direction of the arrow.
5. Disconnect one (1) flat cable (CN005). (See Fig. 2-13)

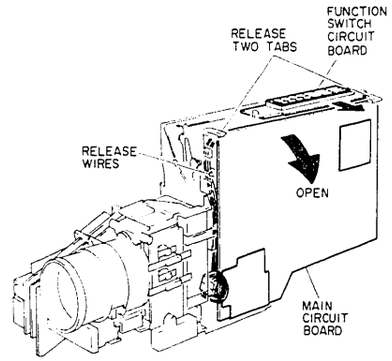


Fig. 2-12 Function Switch Circuit Board Removal

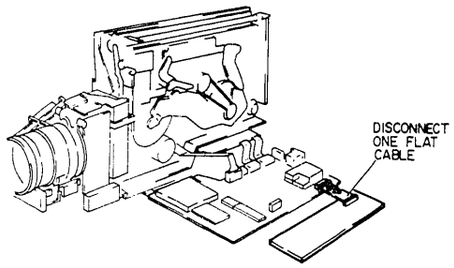


Fig. 2-13 Function Switch Circuit Board Removal

Main Circuit Board Removal (Figs. 2-14, 2-15)

1. Remove the function switch circuit board. (See Figs. 2-12, 2-13)
2. Disconnect five (5) connectors (CN1501, CN611, CN-612, CN903, CN909). (See Fig. 2-14)
3. Remove the shield cover in the luma/chroma section.
4. Disconnect five (5) flat cables (CN408, CN107, CN613, CN905, CN214).
5. Unsolder one (1) lead.
6. Release two (2) tabs of the board holder. (See Fig. 2-15)
7. Remove the main circuit board from the board holder.

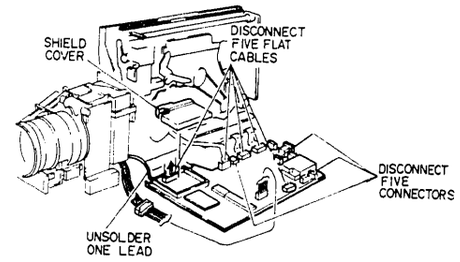


Fig. 2-14 Main Circuit Board Removal

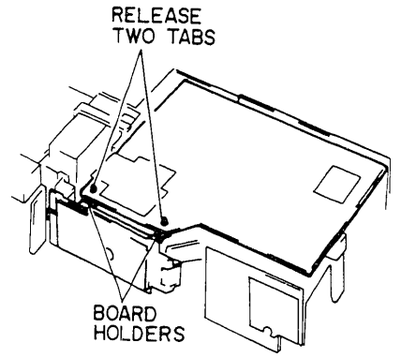


Fig. 2-15 Main Circuit Board Removal

Audio Circuit Board Removal (Figs. 2-16, 2-17, 2-18)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Disconnect connector CN903. (See Fig. 2-16)
3. Disconnect two (2) flat cables (CN408, CN107).
4. Release three (3) tabs and open the audio circuit board. (See Fig. 2-17)
5. Disconnect thirteen (13) connectors (CN415, CN004, CN416, CN126, CN125, CN124, CN123, CN122, CN121, CN120, CN119, CN118, CN117). (See Fig. 2-18)
6. Release one (1) tab and remove the AV OUT connector in the direction of the arrow.

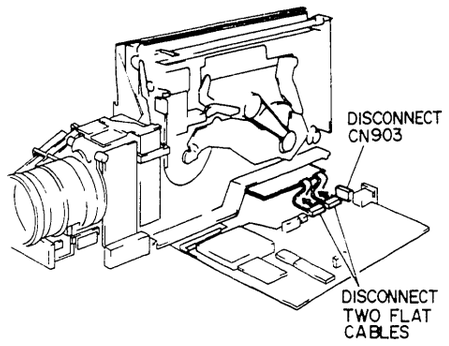


Fig. 2-16 Audio Circuit Board Removal

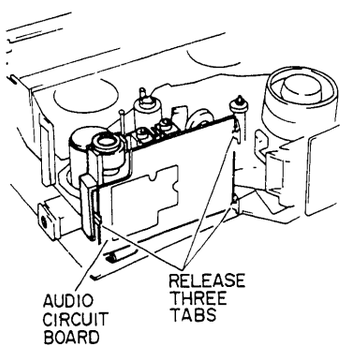


Fig. 2-17 Audio Circuit Board Removal

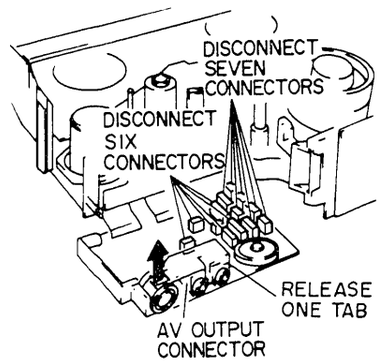


Fig. 2-18 Audio Circuit Board Removal

Process Circuit Board Removal (Figs. 2-19, 2-20, 2-21)

1. Release two (2) tabs and pull out the process circuit board, encoder circuit board and wiring circuit board in the direction of the arrow. (See Fig. 2-19)
2. Disconnect three (3) connectors (CN1101, CN1103, CN1104). (See Fig. 2-20)
3. Remove the process board from the wiring circuit board in the direction of the arrow.
4. Unsolder ground lead. (See Fig. 2-21)

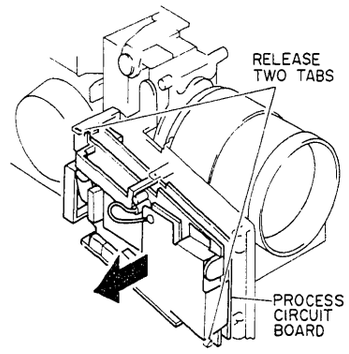


Fig. 2-19 Process Circuit Board Removal

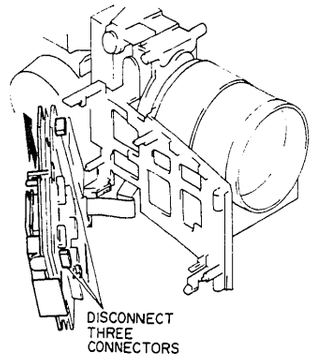


Fig. 2-20 Process Circuit Board Removal

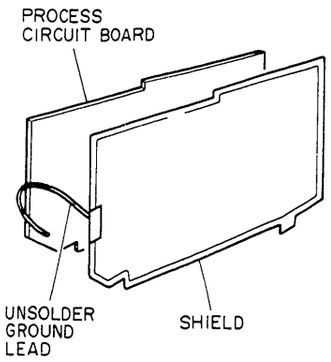


Fig. 2-21 Process Circuit Board Removal

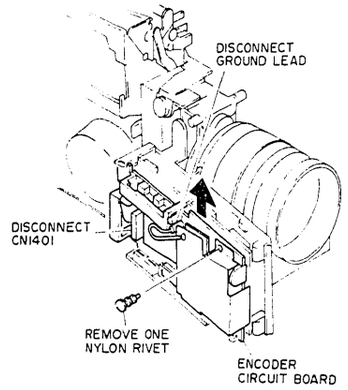


Fig. 2-22 Encoder Circuit Board Removal

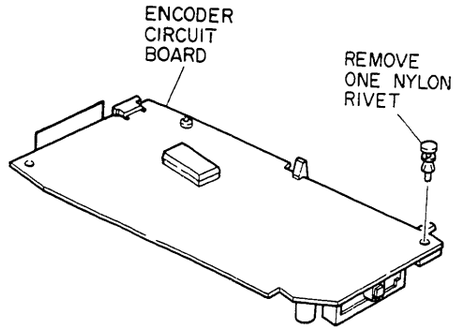


Fig. 2-23 Encoder Circuit Board Removal

Encoder Circuit Board (Zoom Switch Circuit Board and VTR REC Switch Circuit Board) Removal (Figs. 2-22, 2-23, 2-24, 2-25)

1. Release two (2) tabs and pull out the process circuit board, encoder circuit board and wiring circuit board in the direction of the arrow. (See Fig. 2-19)
2. Disconnect connector CN1401. (See Fig. 2-22)
3. Remove one (1) nylon rivet holding the encoder shield cover.
4. Disconnect ground lead.
5. Remove the encoder circuit board from the wiring circuit board in the direction of the arrow.
6. Remove one (1) nylon rivet holding the board flame. (See Fig. 2-23)
7. Release one (1) tab and remove the board flame. (See Fig. 2-24)
8. Unsolder twelve (12) points and remove the zoom switch circuit board. (See Fig. 2-25)
9. Unsolder six (6) points and remove the VTR REC switch circuit board.

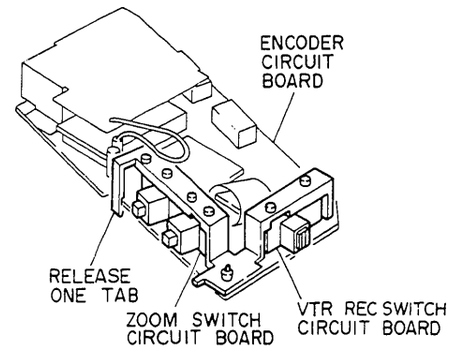


Fig. 2-24 Encoder Circuit Board Removal

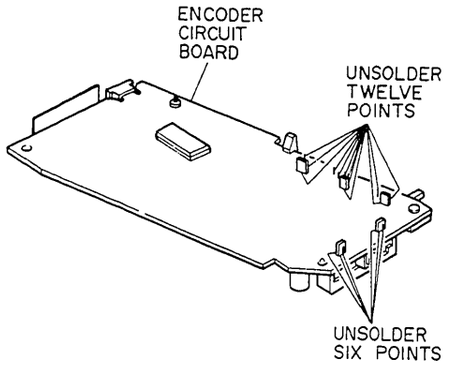


Fig. 2-25 Encoder Circuit Board Removal

Wiring Circuit Board Removal (Figs. 2-26, 2-27, 2-28)

1. Remove the process circuit board. (See Figs. 2-19, 2-20, 2-21)
2. Remove the encoder circuit board. (See Fig. 2-22)
3. Disconnect connector CN1501. (See Fig. 2-26)
4. Disconnect connector CN1509. (See Fig. 2-27)
5. Disconnect two (2) connectors (CN1507, CN5) and one (1) flat cable (CN1511). (See Fig. 2-28)

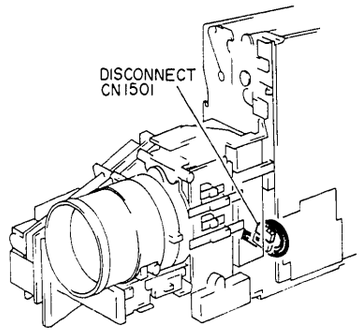


Fig. 2-26 Wiring Circuit Board Removal

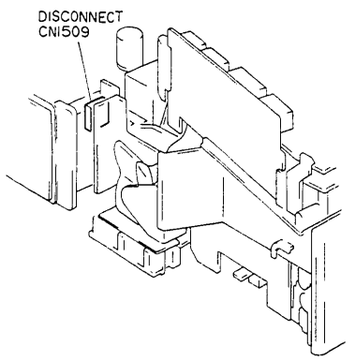


Fig. 2-27 Wiring Circuit Board Removal

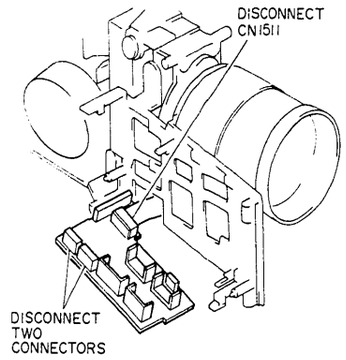


Fig. 2-28 Wiring Circuit Board Removal

Control Circuit Board Removal (Figs. 2-29, 2-30)

1. Release two (2) tabs and pull out the process circuit board, encoder circuit board and wiring circuit board in the direction of the arrow. (See Fig. 2-19)
2. Disconnect one (1) flat cable (CN1511). (See Fig. 2-29)
3. Release three (3) tabs and remove the control board. (See Fig. 2-30)

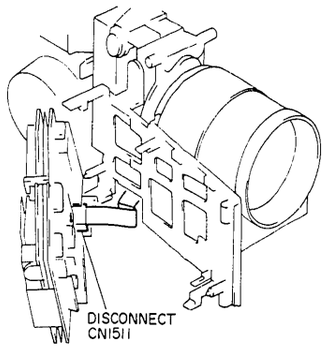


Fig. 2-29 Control Circuit Board Removal

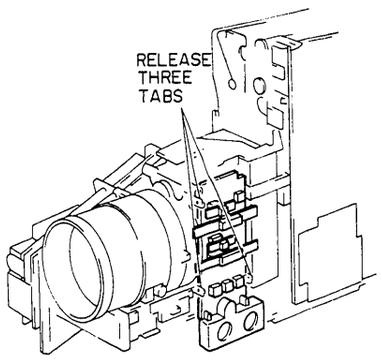


Fig. 2-30 Control Circuit Board Removal

Sensor Circuit Board Removal (Figs. 2-31, 2-32, 2-33, 2-34, 2-35)

1. Release two (2) tabs and pull out the process circuit board, encoder circuit board and wiring circuit board in the direction of the arrow. (See Fig. 2-19)
2. Disconnect three (3) connectors (CN1101, CN1103, CN1104). (See Fig. 2-31)
3. Disconnect two (2) connectors (CN1501, CN004). (See Fig. 2-31)
4. Remove two (2) screws holding the camera section and VTR section. (See Fig. 2-33)
5. Disconnect ground lead and remove the sensor shield cover in the direction of the arrow. (See Fig. 2-34)
6. Remove three (3) screws holding the sensor circuit board. (See Fig. 2-35)
7. Remove the sensor circuit board.

Note: Be careful with the three (3) spring and three (3) washers as they are removed when removing the sensor circuit board.

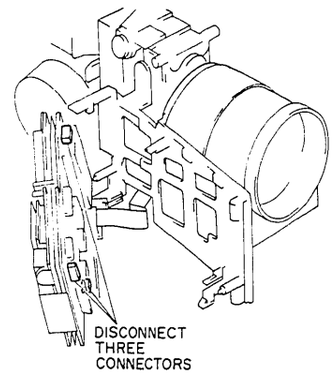


Fig. 2-31 Sensor Circuit Board Removal

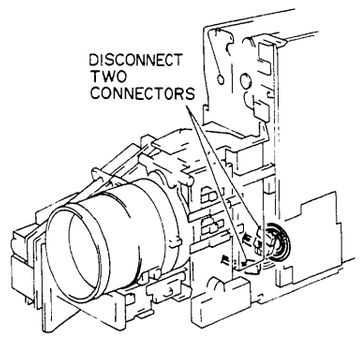


Fig. 2-32 Sensor Circuit Board Removal

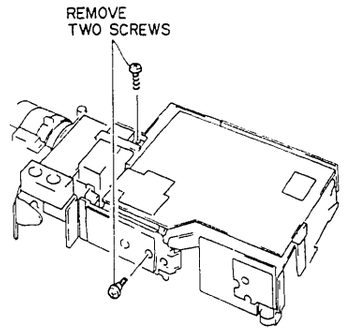


Fig. 2-33 Sensor Circuit Board Removal

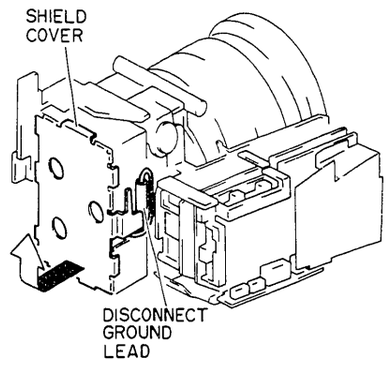


Fig. 2-34 Sensor Circuit Board Removal

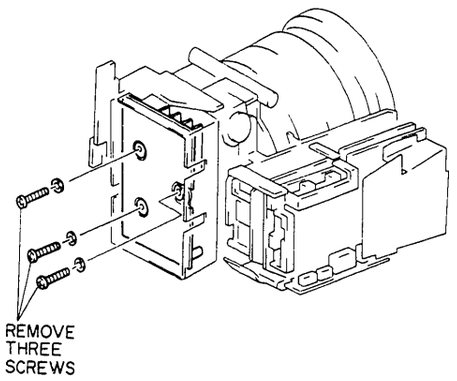


Fig. 2-35 Sensor Circuit Board Removal

Regulator Circuit Board Removal (Figs. 2-36, 2-37)

1. Disconnect two (2) connectors (CN1501, CN004). (See Fig. 2-32)
2. Remove two (2) screws holding the camera section and VTR section. (See Fig. 2-33)
3. Remove two (2) screws holding the bottom flame. (See Fig. 2-36)
4. Disconnect connector CN1509. (See Fig. 2-37)
5. Remove two (2) screws holding the regulator circuit board.

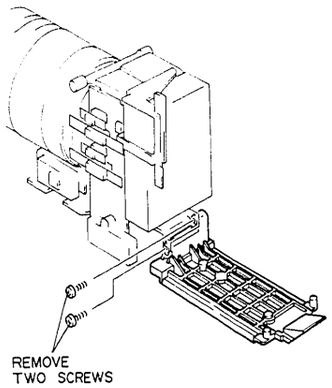


Fig. 2-36 Regulator Circuit Board Removal

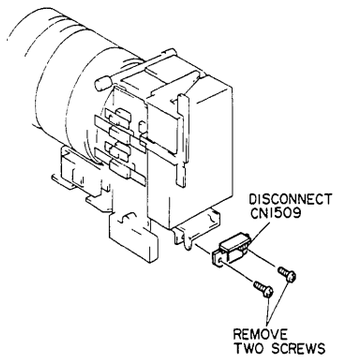


Fig. 2-37 Regulator Circuit Board Removal

EVF Connector Removal (Figs. 2-38, 2-39)

1. Disconnect connector CN004. (See Fig. 2-38)
2. Disconnect connector CN1401. (See Fig. 2-39)
3. Remove two (2) screws holding the EVF connector.

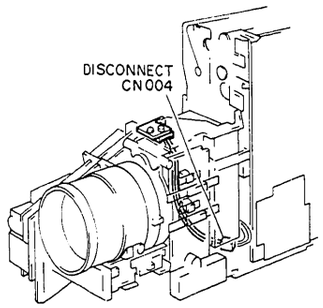


Fig. 2-38 EVF Connector Removal

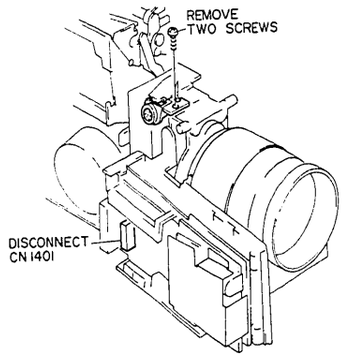


Fig. 2-39 EVF Connector Removal

TAPE TRANSPORT MECHANISM

Remove the right case and left case as previously given.

Tape Transport Mechanism Removal (Figs. 2-41, 2-42)

1. Remove the function switch circuit board. (See Figs. 2-12, 2-13)
2. Remove the main circuit board. (See Figs. 2-14, 2-15)
3. Remove the audio circuit board. (See Figs. 2-16, 2-17, 2-18)
4. Disconnect two (2) connectors (CN1501, CN004). (See Fig. 2-41)
5. Remove two (2) screws holding the camera section and VTR section. (See Fig. 2-42)

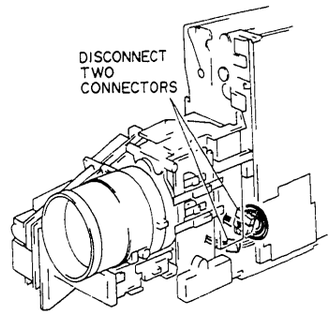


Fig. 2-41 Tape Transport Mechanism Removal

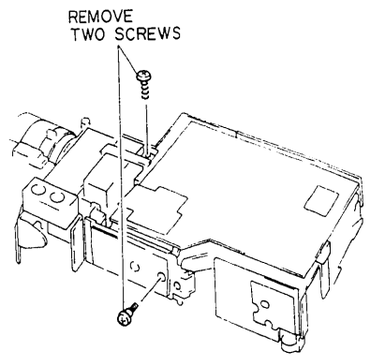


Fig. 2-42 Tape Transport Mechanism Removal

Cassette Holder Removal
(Figs. 2-43, 2-44, 2-45, 2-46, 2-47)

1. Disconnect two (2) connectors (CN1501, CN004). (See Fig. 2-41)
2. Remove two (2) screws holding the camera section and VTR section. (See Fig. 2-42)
3. Remove one (1) screw holding the safety tab switch. (See Fig. 2-43)
4. Release one (1) tab and lift up the cassette holder.
5. Remove the cassette holder spring. (See Fig. 2-44)
6. Remove two (2) screws holding the cassette holder. (See Figs. 2-44, 2-45)
7. Release two (2) tabs. (See Figs. 2-46, 2-47)
8. Move the front arm in the direction of arrow (A).
9. Move the rear arm in the direction of arrow (B).

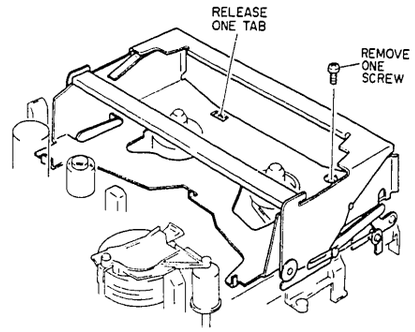


Fig. 2-43 Cassette Holder Removal

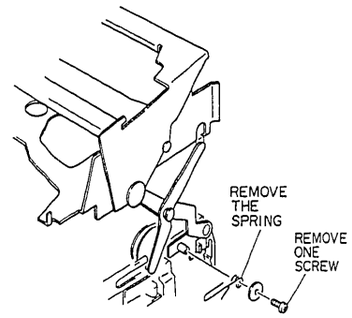


Fig. 2-44 Cassette Holder Removal

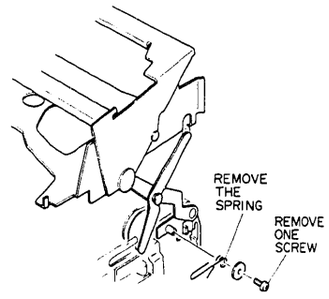


Fig. 2-45 Cassette Holder Removal

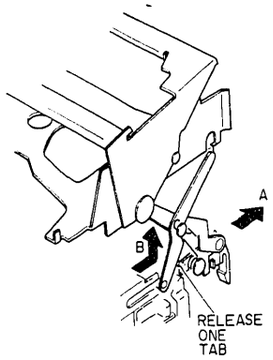


Fig. 2-46 Cassette Holder Removal

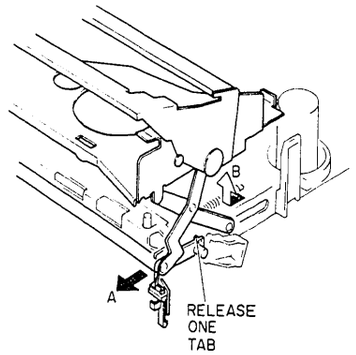


Fig. 2-47 Cassette Holder Removal

Video Head (Upper Cylinder) Removal (Figs. 2-48, 2-49)

1. Remove one (1) screw holding the static discharge brush. (See Fig. 2-48)
2. Remove two (2) screws and pull out the upper cylinder.
3. Unsolder eight (8) leads on the upper cylinder. (See Fig. 2-49)

Note: Be careful that your fingers or tools do not touch the video head tips during work.
Install the video head by the reverse procedure to removal.
Tighten two (2) video head holding screws alternately.
Adjust as follows after installing the video head.
* Tracking Preset Adjustment
* X Value Adjustment
* Head Switching Point Adjustment
* Record Chroma and Luminance Level Adjustment

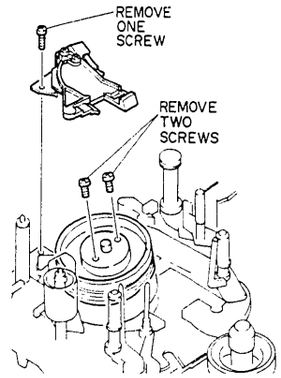


Fig. 2-49 Video Head Removal

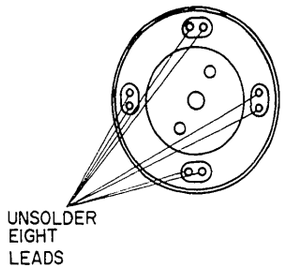


Fig. 2-48 Video Head Removal

Audio/Control (A/C) Head Removal (Figs. 2-50, 2-51, 2-52)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Disconnect connector CN611. (See Fig. 2-50)
3. Open the audio circuit board. (See Fig. 2-17)
4. Disconnect connector CN415. (See Fig. 2-51)
5. Release the wires from the wire holder. (See Fig. 2-52)
6. Remove three (3) screws holding the A/C head.

Note: Install the A/C head by the reverse procedure to removal.
Adjust as follows after installing the A/C head.
* A/C Head Adjustment
* Audio Playback Gain
* Audio Bias Level

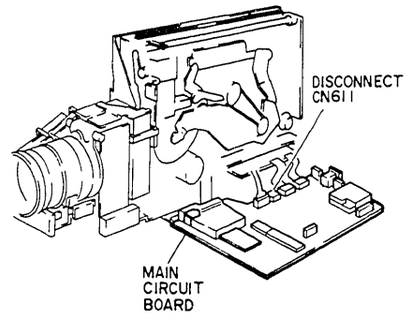


Fig. 2-50 Audio/Control (A/C) Head Removal

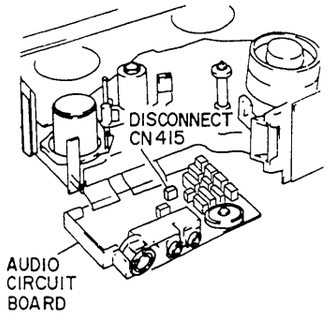


Fig. 2-51 Audio/Control Head Removal

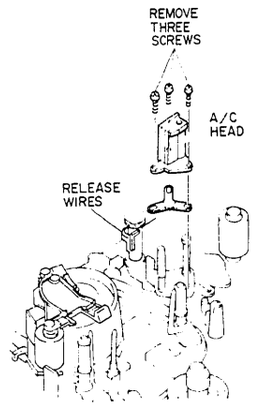


Fig. 2-52 Audio/Control Head Removal

Full Erase (FE) Head Removal (Figs. 2-53, 2-54)

1. Open the audio circuit board. (See Fig. 2-17)
2. Disconnect connector CN416. (See Fig. 2-53)
3. Remove the spring between the FE head base and chassis. (See Fig. 2-54)
4. Remove the washer and pull out the FE head base.
5. Remove one (1) screw holding the FE head.

Note: Take care of the spring position when reinstalling.

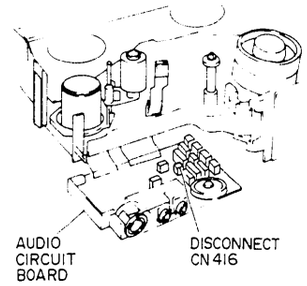


Fig. 2-53 Full Erase (FE) Head Removal

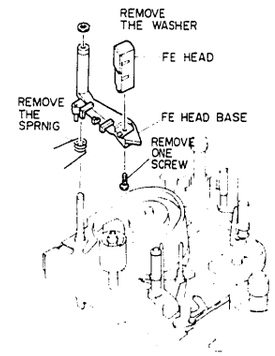


Fig. 2-54 Full Erase Head Removal

Supply End Sensor Removal (Figs. 2-55, 2-56, 2-57)

1. Open the audio circuit board. (See Fig. 2-17)
2. Disconnect connector CN123. (See Fig. 2-55)
3. Remove two (2) screws holding the camera section and VTR section. (See Fig. 2-56)
4. Release one (1) tab. (See Fig. 2-57)

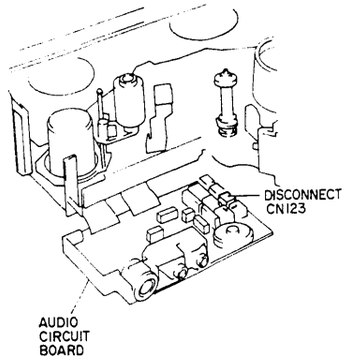


Fig. 2-55 Supply End Sensor Removal

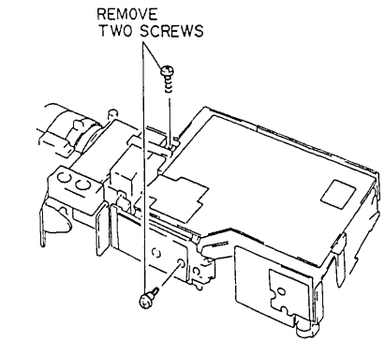


Fig. 2-56 Supply End Sensor Removal

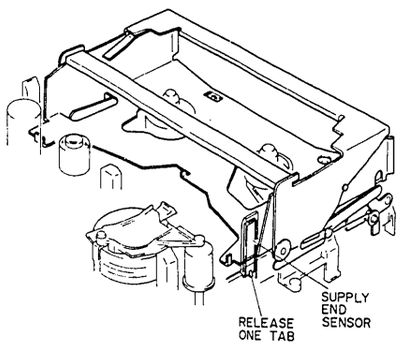


Fig. 2-57 Supply End Sensor Removal

Take-up End Sensor Removal (Fig. 2-58)

1. Open the audio circuit board. (See Fig. 2-17)
2. Disconnect connector CN124. (See Fig. 2-58)
3. Release one (1) tab and remove the take-up end sensor.

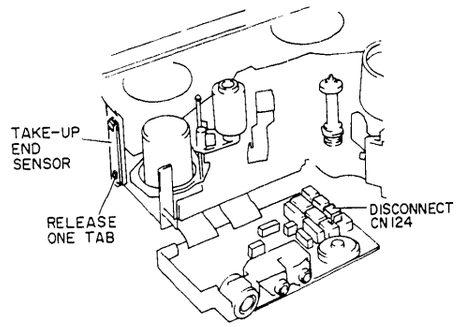


Fig. 2-58 Take-up End Sensor Removal

Take-up Reel Sensor Removal (Figs. 2-59, 2-60)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Open the audio circuit board. (See Fig. 2-17)
3. Disconnect connector CN119. (See Fig. 2-59)
4. Remove the wires from the wire holders. (See Fig. 2-60)
5. Remove the PB/REC drive arm. (See Fig. 2-94)
6. Remove the slider. (See Fig. 2-99)
7. Remove the (1) screw holding the reel sensor.

Note: The supply reel sensor removal is given in detail on Figs. 2-104, 2-105, 2-106.

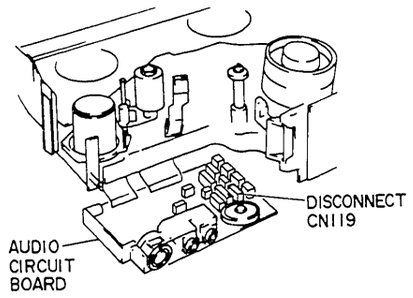


Fig. 2-59 Take-up Reel Sensor Removal

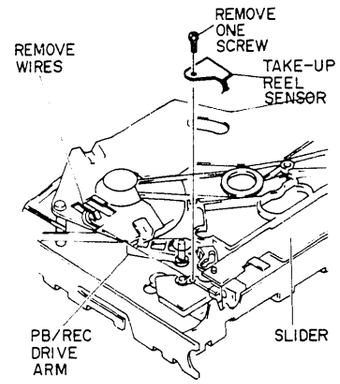


Fig. 2-60 Take-up Reel Sensor Removal

Dew Sensor Removal (Figs. 2-61, 2-62)

1. Open the audio circuit board. (See Fig. 2-17)
2. Disconnect connector CN120. (See Fig. 2-61)
3. Remove one (1) screw holding the dew sensor. (See Fig. 2-62)

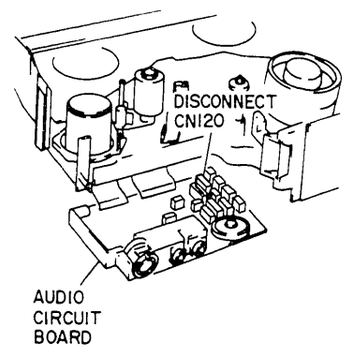


Fig. 2-61 Dew Sensor Removal

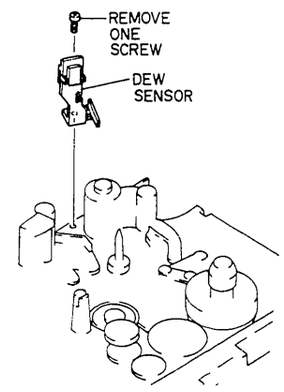


Fig. 2-62 Dew Sensor Removal

Cassette Holder Switch Removal (Figs. 2-63, 2-64)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Open the audio circuit board. (See Fig. 2-17)
3. Disconnect connector CN121. (See Fig. 2-63)
4. Remove the cassette holder. (See Figs. 2-43, 2-44, 2-45, 2-46, 2-47)
5. Remove the wires from the wire holders. (See Fig. 2-64)
6. Remove one (1) screw holding the cassette holder switch.

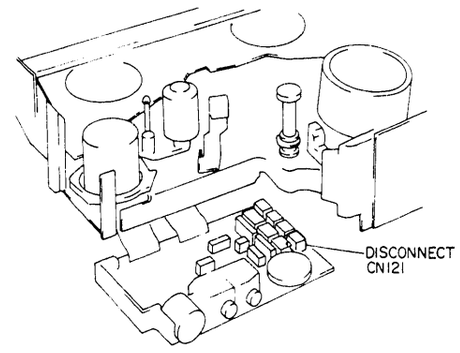


Fig. 2-63 Cassette Holder Switch Removal

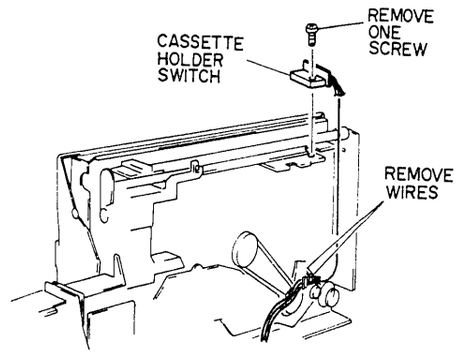


Fig. 2-64 Cassette Holder Switch Removal

Safety Tab Switch Removal (Figs. 2-65, 2-66)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Open the audio circuit board. (See Fig. 2-17)
3. Disconnect connector CN122. (See Fig. 2-65)
4. Remove the wires form the wire holders. (See Fig. 2-66)
5. Remove one (1) screw holding the safety tab switch.

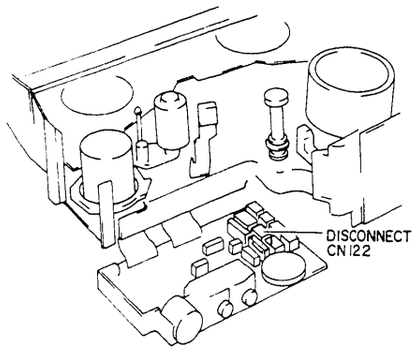


Fig. 2-65 Safety Tab Switch Removal

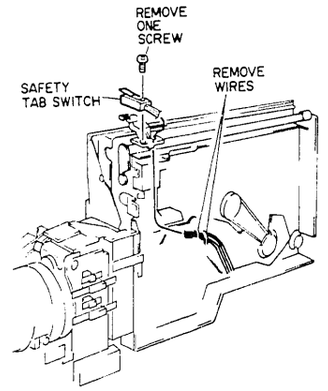


Fig. 2-66 Safety Tab Switch Removal

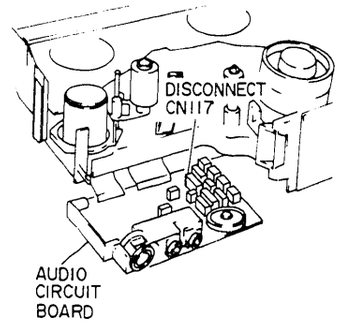


Fig. 2-67 Mechanism State Switch Removal

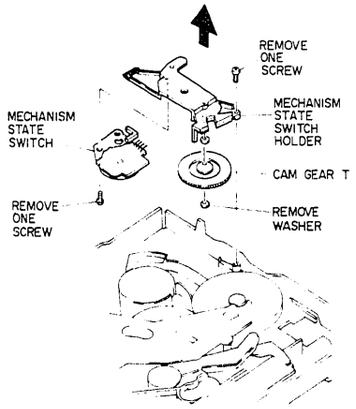


Fig. 2-68 Mechanism State Switch Removal

Mechanism State Switch Removal (Figs. 2-67, 2-68)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Open the audio circuit board. (See Fig. 2-17)
3. Disconnect connector CN117. (See Fig. 2-67)
4. Remove one (1) screw holding the mechanism state switch holder. (See Fig. 2-68)
5. Remove the mechanism state switch holder in the direction of the arrow.
6. Remove the washer and remove the cam gear T.
7. Remove one (1) screw holding the mechanism state switch.

Note: Adjust as follows after installing the mechanism state switch.
* Mechanism State Switch Adjustment

End Lamp Removal (Fig. 2-69)

1. Open the audio circuit board. (See Fig. 2-17)
2. Disconnect connector CN125. (See Fig. 2-69)
3. Remove the spring between the chassis and end lamp.
4. Remove one (1) screw holding the end lamp.

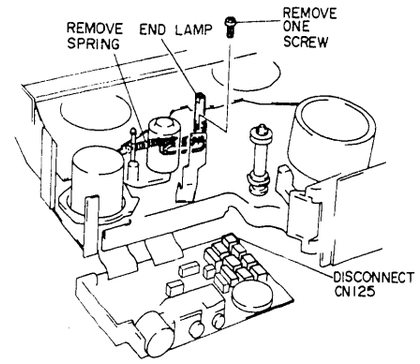


Fig. 2-69 End Lamp Removal

Lower Cylinder (Cylinder Motor Assembly) Removal (Figs. 2-70, 2-71)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Disconnect two (2) flat cables (CN613, CN214). (See Fig. 2-70)
3. Remove one (1) screw holding the static discharge brush (See Fig. 2-48).
4. Remove three (3) screws holding the lower cylinder and cylinder shield. (See Fig. 2-71)

Note: Be careful that your fingers or tools do not touch the video head tips during work.
Install the video head by the reverse procedure to removal.
Tighten three (3) Lower cylinder holding screws alternately.
Adjust as follows after installing the video head.
* Tracking Preset Adjustment
* X Value Adjustment
* Head Switching Point Adjustment
* Record Chroma and Luminance Level Adjustment

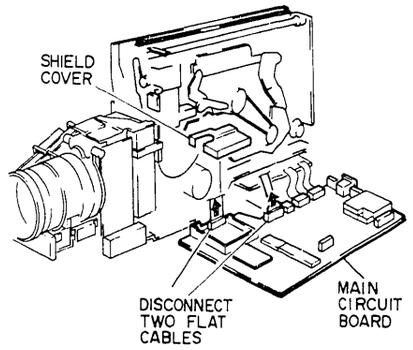


Fig. 2-70 Lower Cylinder (Cylinder Motor Assembly) Removal

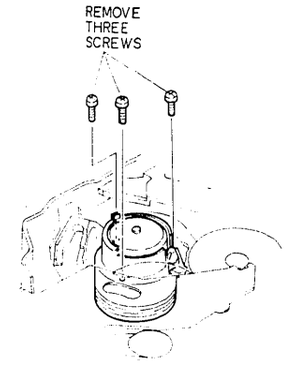


Fig. 2-71 Lower Cylinder Removal

Capstan Motor Removal (Figs. 2-72, 2-73, 2-74)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Disconnect connector CN612. (See Fig. 2-72)
3. Remove the belt cover. (See Fig. 2-73)
4. Remove the belt from the capstan motor pulley.
5. Lift up the cassette holder. (See Fig. 2-43)
6. Remove two (2) screws holding the capstan motor holder. (See Fig. 2-74)
7. Remove two (2) screws holding the capstan motor.

Note: Adjust as follows after installing the capstan motor.
* 30 Hz Reference Frequency Adjustment

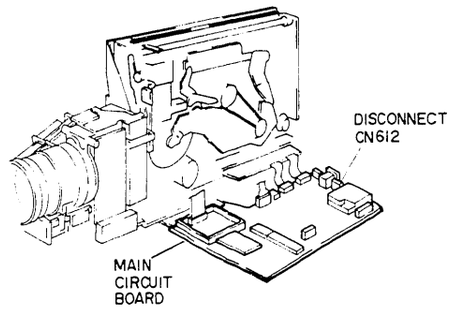


Fig. 2-72 Capstan Motor Removal

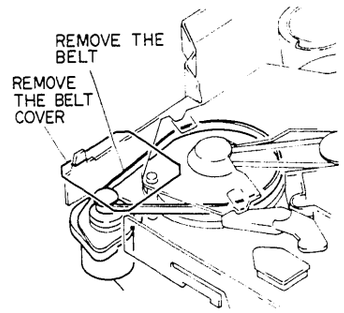


Fig. 2-73 Capstan Motor Removal

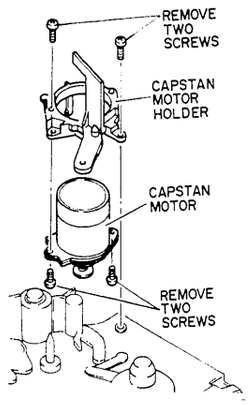


Fig. 2-74 Capstan Motor Removal

Loading Motor Removal (Figs. 2-75, 2-76, 2-77)

1. Open the audio circuit board. (See Fig. 2-17)
2. Disconnect connector CN118. (See Fig. 2-75)
3. Remove the wires from the wire holders. (See Fig. 2-76)
4. Remove three (3) screws holding the loading motor block.
5. Remove the belt of the loading motor. (See Fig. 2-77)
6. Remove two (2) screws holding the loading motor.

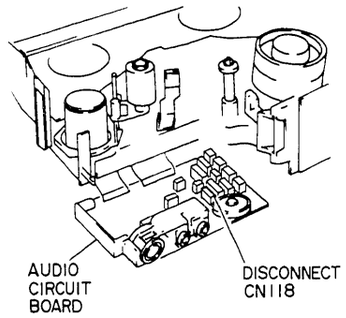


Fig. 2-75 Loading Motor Removal

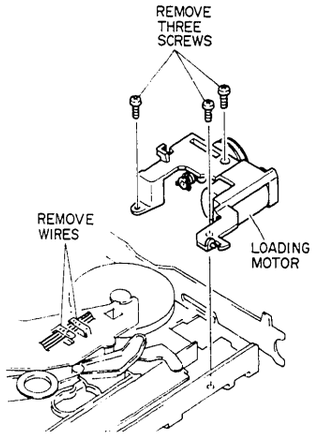


Fig. 2-76 Loading Motor Removal

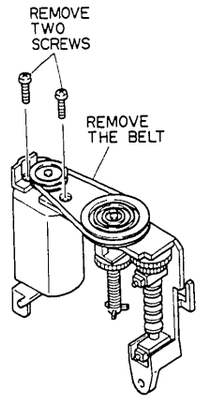


Fig. 2-77 Loading Motor Removal

Catcher Block Removal (Figs. 2-78, 2-79)

1. Remove one (1) screw holding the static discharge brush. (See Fig. 2-78)
2. Remove three (3) screws holding the catcher block.
3. Remove three (3) screws holding the cylinder assembly. (See Fig. 2-79)

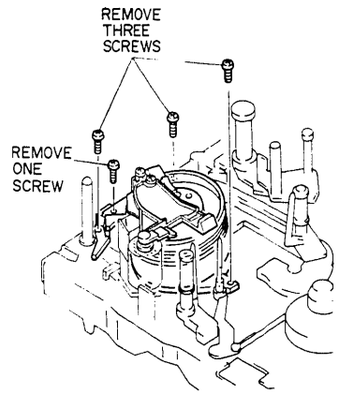


Fig. 2-78 V-Stopper Block Removal

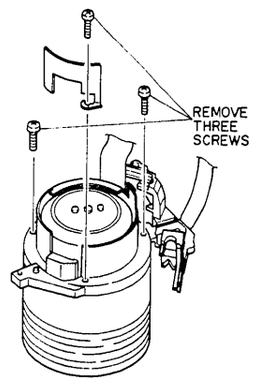


Fig. 2-79 V-Stopper Block Removal

Impedance Roller Removal (Fig. 2-80)

1. Remove the static discharge brush. (See Fig. 2-78)
2. Remove one (1) nut and pull out the impedance roller. (See Fig. 2-80)

Note: Adjust as follows after installing the impedance roller.
* Impedance Roller Height Adjustment

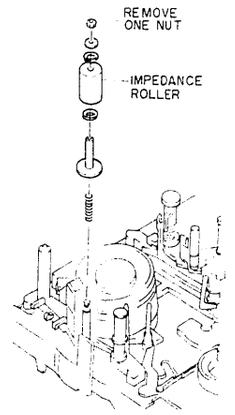


Fig. 2-80 Impedance Roller Removal

Pressure Roller Arm Removal (Fig. 2-81)

1. Remove the capstan motor holder. (See Figs. 2-72, 2-73, 2-74)
2. Pull out the pressure roller arm. (See Fig. 2-81)

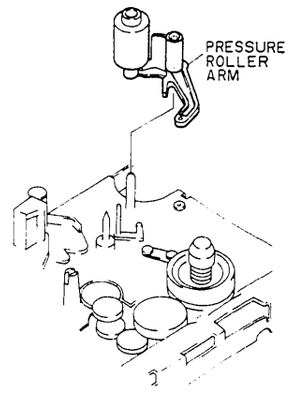


Fig. 2-81 Pressure Roller Removal

Tension Arm and Tension Band Removal (Fig. 2-82)

1. Remove the cassette holder. (See Figs. 2-43, 2-44, 2-45, 2-46, 2-47)
2. Remove one (1) washer. (See Fig. 2-82)
3. Remove the tension spring.
4. Remove one (1) screw holding the tension arm and tension band.

Note: Adjust as follows after installing the tension arm and tension band.
* Tension Arm position Adjustment
* Back tension Adjustment

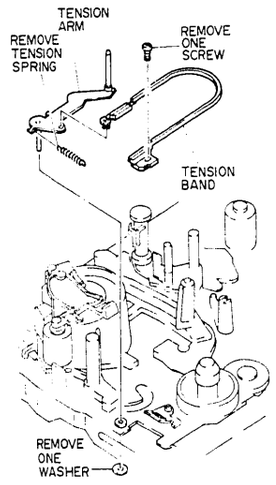


Fig. 2-82 Tension Arm and Tension Band Removal

Take-up Sub Brake Removal (Fig. 2-83)

1. Remove the cassette holder. (See Figs. 2-43, 2-44, 2-45, 2-46, 2-47)
2. Remove the take-up sub brake spring. (See Fig. 2-83)
3. Release one (1) tab.
4. Pull out the take-up sub brake.

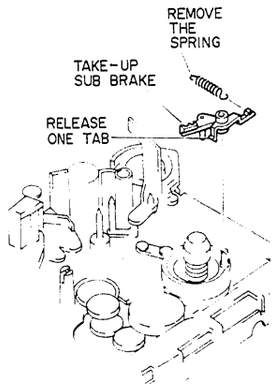


Fig. 2-83 Take-up Sub Brake Removal

Supply Sub Brake Removal (Fig. 2-84)

1. Remove the cassette holder. (See Figs. 2-43, 2-44, 2-45, 2-46, 2-47, 2-48)
2. Remove the supply sub brake spring. (See Fig. 2-84)
3. Release one (1) tab.
4. Pull out the supply sub brake.

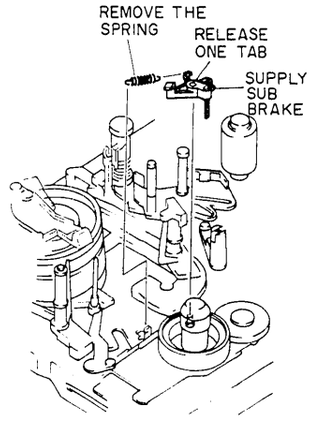


Fig. 2-84 Supply Sub Brake Removal

Take-up Reel Disk Removal (Fig. 2-85)

1. Remove the cassette holder. (See Figs. 2-43, 2-44, 2-45, 2-46, 2-47, 2-48)
2. Remove one (1) washer and pull out the take-up reel table. (See Fig. 2-85)

Note: Take care not to lose the washer in the lower section.

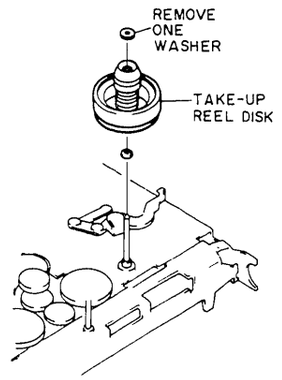


Fig. 2-85 Take-up Reel Disk Removal

Supply Reel Disk Removal (Fig. 2-86)

1. Remove the cassette holder. (See Figs. 2-43, 2-44, 2-45, 2-46, 2-47)
2. Remove the tension arm and tension band. (See Fig. 2-82)
3. Remove the supply sub brake. (See Fig. 2-84)
4. Remove one (1) washer and pull out the supply reel table. (See Fig. 2-86)

Note: Take care not to lose the washer in the lower section. Reinstall the supply reel table by the reverse procedure to removal.

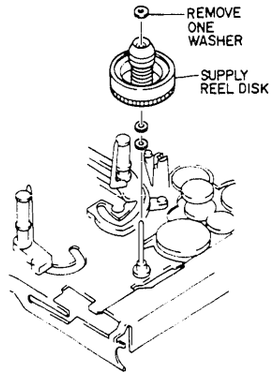


Fig. 2-86 Supply Reel Disk Removal

Guide Post (1) and Guide Post (2) Removal (Fig. 2-87)

1. Remove one (1) nut holding the guide post (1).
2. Remove one (1) nut holding the guide post (2).

Note: Adjust as follows after installing the guide post.
* Tape Guide Post Height

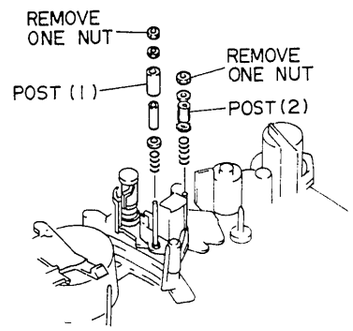


Fig. 2-87 Guide Post (1) and Guide Post (2) Removal

A/C Head Base Removal (Fig. 2-88)

1. Remove the A/C head. (See Figs. 2-50, 2-51, 2-52)
2. Remove one (1) nut, two (2) washers and one (1) bearing. (See Fig. 2-88)
3. Pull out the A/C head base.

Note: Reinstall the A/C head base so the A/C head height adjustment nut is positioned 2.5 to 3 mm below the point of the shaft.
After reinstalling, perform the following adjustments.

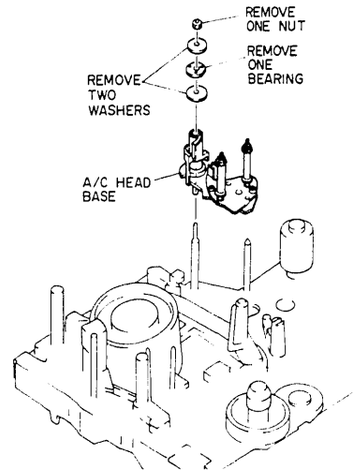


Fig. 2-88 A/C Head Base Removal

Guide Arm Assembly Removal (Fig. 2-89)

1. Remove the A/C head. (See Figs. 2-50, 2-51, 2-52)
2. Remove the A/C head base. (See Fig. 2-88)
3. Remove one (1) washer and pull out the guide arm assembly. (See Fig. 2-89)

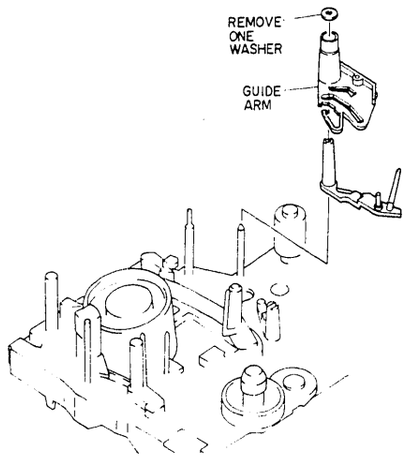


Fig. 2-89 Guide Arm Assembly Removal

Supply Guide Roller and Take-up Guide Roller Removal (Fig. 2-90)

1. Remove one (1) hex screw holding the supply guide roller.
2. Remove the guide roller cap.
3. Remove one (1) hex screw holding the take-up guide roller.

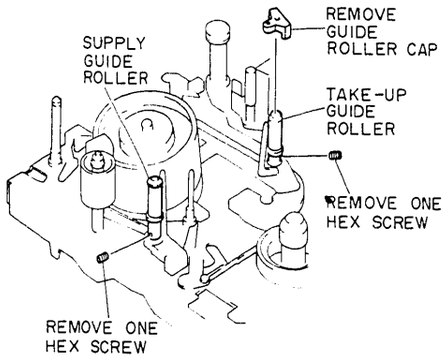


Fig. 2-90 Supply Guide Roller and Take-up Guide Roller Removal

Cam Gear Plate Removal (Fig. 2-91)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the wires from the wire holders. (See Fig. 2-91)
3. Remove the belt cover.
4. Remove five (5) screws holding the cam gear plate.

Note: When reinstalling, tighten all the screws and then loose them by 3/4 turns.

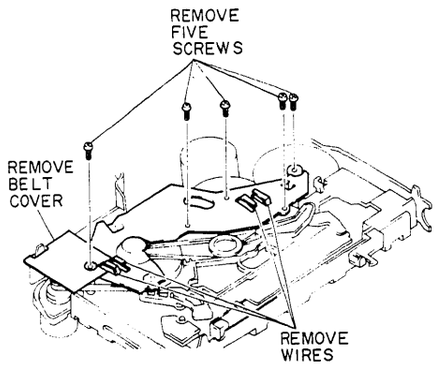


Fig. 2-91 Cam Rear Plate Removal

Capstan Flywheel Removal (Fig. 2-92)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the cam gear plate. (See Fig. 2-91)
3. Remove two (2) belts from the capstan flywheel. (See Fig. 2-92)
4. Remove one (1) washer and pull out the capstan flywheel.

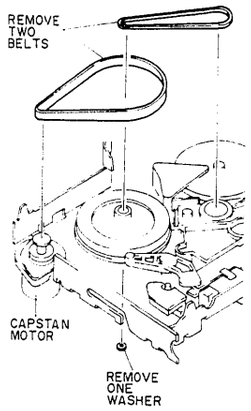


Fig. 2-92 Capstan Flywheel Removal

A/C Head Control Arm Removal (Fig. 2-93)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the cam gear plate. (See Fig. 2-91)
3. Pull out the A/C head control arm. (See Fig. 2-93)

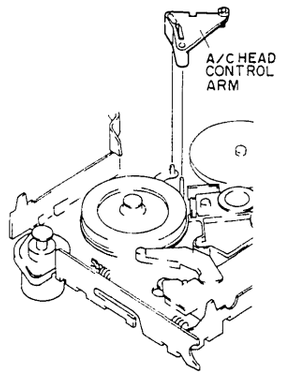


Fig. 2-93 A/C Head Control Arm Removal

PB/REC Drive Arm Removal (Fig. 2-94)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove one (1) washer and pull out the PB/REC drive arm. (See Fig. 2-94)

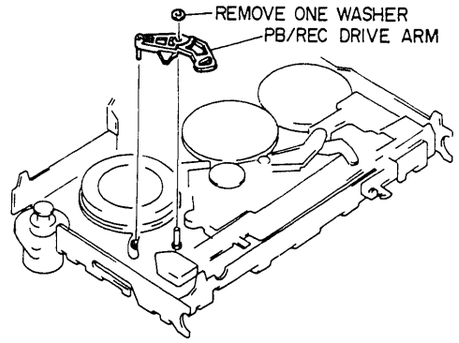


Fig. 2-94 PB/REC Drive Arm Removal

Cam Gear Arms (1) and (2) Removal (Fig. 2-95)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the cam gear plate. (See Fig. 2-91)
3. Release one (1) tab and remove the idler drive arm. (See Fig. 2-95)
4. Pull out the cam gear arms (1) and (2).

Note: Adjust as follows after installing the cam Gear Arms.
* Loading Cam Gear Adjustment

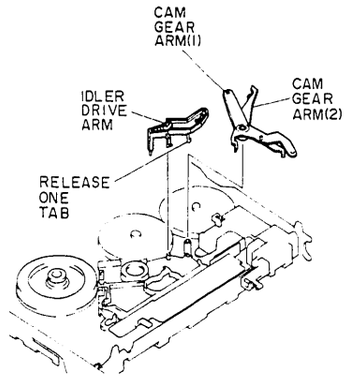


Fig. 2-95 Cam Gear Arms (1) and (2) Removal

Supply and Take-up Loading Cam Gears Removal (Figs. 2-96, 2-97)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the mechanism state switch holder. (See Figs. 2-67, 2-68)
3. Remove the loading motor block. (See Figs. 2-75, 2-76)
4. Remove the cam gear plate. (See Fig. 2-91)
5. Remove the A/C head control arm. (See Fig. 2-93)
6. Remove the cam gear arms (1) and (2). (See Fig. 2-95)
7. Turn the loading cam gear to set the guide roller to the loading state. (See Fig. 2-96)
8. Remove one (1) E ring and one (1) washer. (See Fig. 2-97)
9. Remove two (2) E rings and pull out the loading cam gear. (See Fig. 2-96)

Note: After reinstalling the loading cam gears, adjust the mechanism state switch.

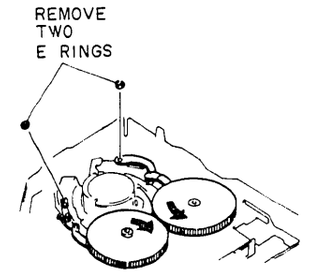


Fig. 2-96 Supply and Take-up Loading Cam Gears Removal

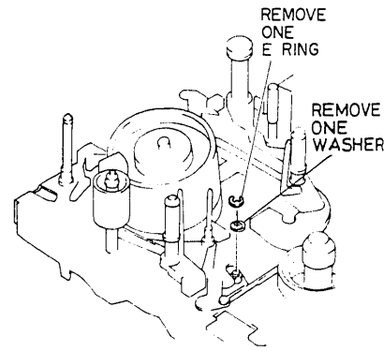


Fig. 2-97 Supply and Take-up Loading Cam Gears Removal

Guide Roller Base Removal (Fig. 2-98)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the loading motor block. (See Figs. 2-75, 2-76)
3. Remove the mechanism state switch holder. (See Figs. 2-67, 2-68)
4. Remove the cam gear plate. (See Fig. 2-91)
5. Remove the cam gear arms (1) and (2). (See Fig. 2-95)
6. Remove the loading cam gear. (See Figs. 2-96, 2-97)
7. Remove two (2) screws holding the limit plate and guide roller base. (See Fig. 2-98)

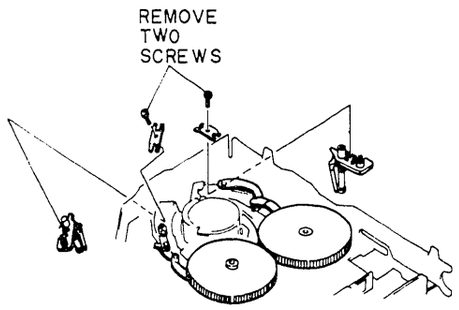


Fig. 2-98 Guide Roller Base Removal

Slide Removal (Fig. 2-99)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the cam gear plate. (See Fig. 2-91)
3. Remove the PB/REC drive arm. (See Fig. 2-93)
4. Remove the cam gear arms (1) and (2). (See Fig. 2-94)
5. Remove one (1) screw and one (1) washer holding the slider. (See Fig. 2-99)

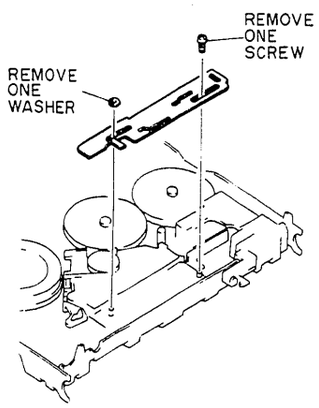


Fig. 2-99 Slider Removal

Reel Gear Block Removal (Fig. 2-100)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the cam gear plate. (See Fig. 2-91)
3. Remove the PB/REC drive arm. (See Fig. 2-94)
4. Remove the cam gear arms (1) and (2). (See Fig. 2-95)
5. Remove the slider. (See Fig. 2-99)
6. Remove the belt from the reel gear block. (See Fig. 2-100)
7. Remove three (3) screws holding the reel gear block.

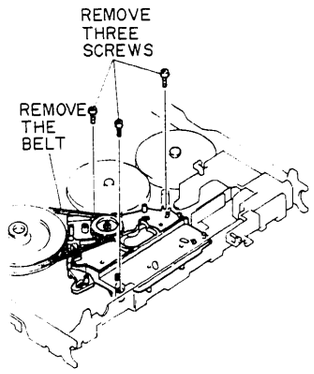


Fig. 2-100 Reel Gear Block Removal

Main Brake Arm Removal (Fig. 2-101)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the cam gear plate. (See Fig. 2-91)
3. Remove the PB/REC drive arm. (See Fig. 2-94)
4. Remove the cam gear arms (1) and (2). (See Fig. 2-95)
5. Remove the slider. (See Fig. 2-99)
6. Remove the reel gear block. (See Fig. 2-100)
7. Pull out the main brake drive arm. (See Fig. 2-101)

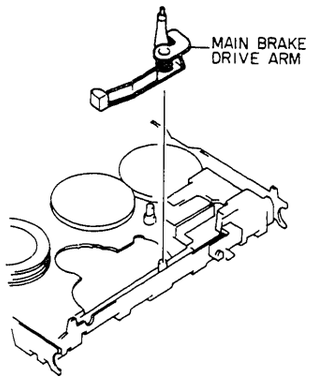


Fig. 2-101 Main Brake Arm Removal

Damper Removal (Fig. 2-102)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove one (1) screw holding the damper. (See Fig. 2-102)

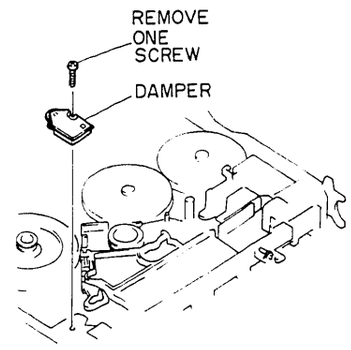


Fig. 2-102 Damper Removal

Up Slider Removal (Fig. 2-103)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Remove the cam gear plate. (See Fig. 2-91)
3. Remove the PB/REC drive arm. (See Fig. 2-94)
4. Remove the cam gear arms (1) and (2). (See Fig. 2-95)
5. Remove the slider. (See Fig. 2-99)
6. Remove the damper. (See Fig. 2-102)
7. Remove the up slider spring. (See Fig. 2-103)
8. Remove one (1) screw holding the lock holder.
9. Remove the up slider in the direction of the arrow.

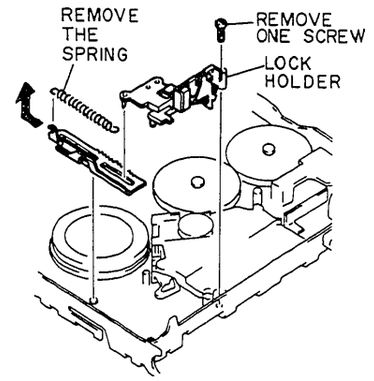


Fig. 2-103 Up Slider Removal

Quick Slider and Supply Reel Sensor Removal (Figs. 2-104, 2-105, 2-106)

1. Open the main circuit board and function switch circuit board. (See Fig. 2-12)
2. Open the audio circuit board. (See Fig. 2-17)
3. Disconnect connector CN126. (See Fig. 2-104)
4. Remove the loading motor block. (See Figs. 2-75, 2-76)
5. Remove the cam gear plate. (See Fig. 2-91)
6. Remove the PB/REC drive arm. (See Fig. 2-94)
7. Remove the cam gear arms (1) and (2). (See Fig. 2-95)
8. Remove one (1) screw holding the quick slider. (See Fig. 2-105)
9. Remove one (1) screw holding the supply reel sensor. (See Fig. 2-106)

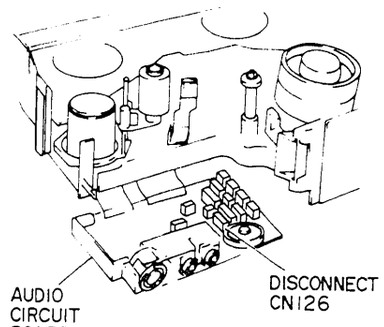


Fig. 2-104 Quick Slider and Supply Reel Sensor Removal

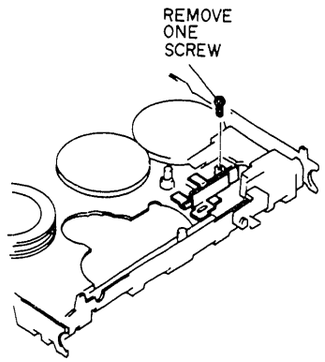


Fig. 2-105 Quick Slider and Supply Reel Sensor Removal

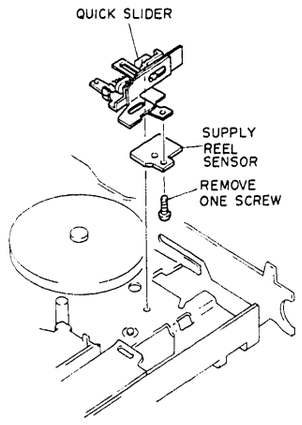


Fig. 2-106 Quick Slider and Supply Reel Sensor Removal

LENS BLOCK

Lens Block Removal
(Figs. 2-107, 2-108, 2-109, 2-110, 2-111)

1. Disconnect two (2) connectors (CN1507, CN8). (See Fig. 2-107)
2. Release two (2) tabs and pull out the process circuit board, encoder circuit board and wiring circuit board in the direction of the arrow.
3. Remove three (3) screws holding the board holder. (See Fig. 2-108)
4. Remove the sensor board. (See Figs. 2-31, 2-32, 2-33, 2-34, 2-35, 2-36)
5. Remove two (2) screws and sensor shield case. (See Fig. 2-109)
6. Remove four (4) screws holding the lens block. (See Figs. 2-110, 2-111)

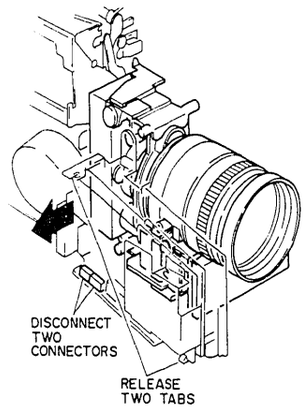


Fig. 2-107 Lens Block Removal

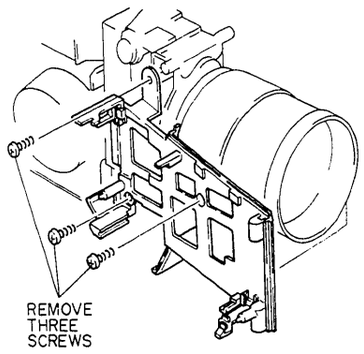


Fig. 2-108 Lens Block Removal

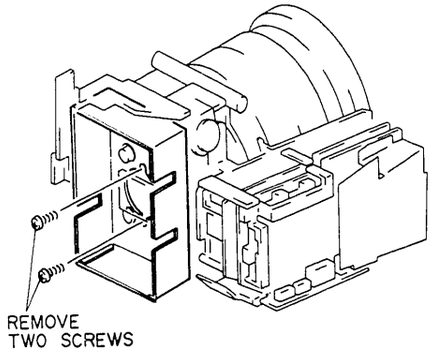


Fig. 2-109 Lens Block Removal

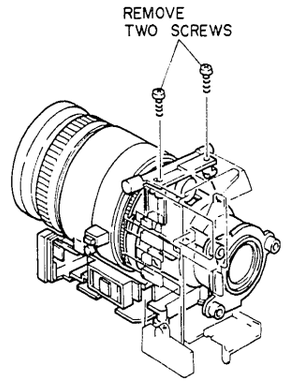


Fig. 2-110 Lens Block Removal

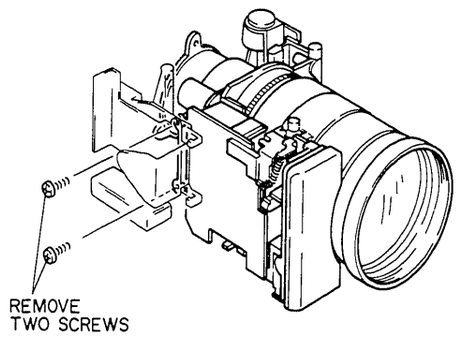


Fig. 2-111 Lens Block Removal

Autofocus Circuit Board Removal
(Figs. 2-112, 2-113, 2-114)

1. Remove the lens block as previously given.
2. Unsolder two (2) points and remove the autofocus shield cover. (See Fig. 2-112)
3. Remove two (2) screws holding the autofocus circuit board. (See Fig. 2-113)
4. Unsolder five (5) points and open the autofocus circuit board.
5. Disconnect four (4) connectors (CN1, CN2, CN3, CN4). (See Fig. 2-114)

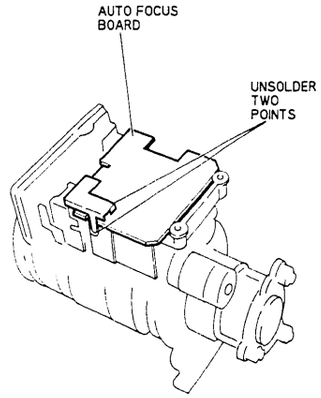


Fig. 2-112 Autofocus Circuit Board Removal

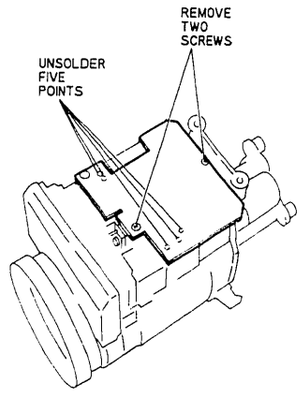


Fig. 2-113 Autofocus Circuit Board Removal

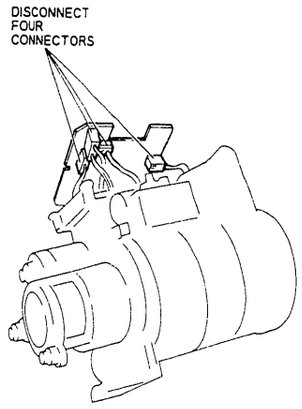


Fig. 2-114 Autofocus Circuit Board Removal

Zoom Motor Removal (Figs. 2-115, 2-116)

1. Remove the lens block as previously given.
2. Open the autofocus circuit board. (See Fig. 2-113)
3. Disconnect connector CN1. (See Fig. 2-115)
4. Remove two (2) screws holding the zoom motor. (See Fig. 2-116)

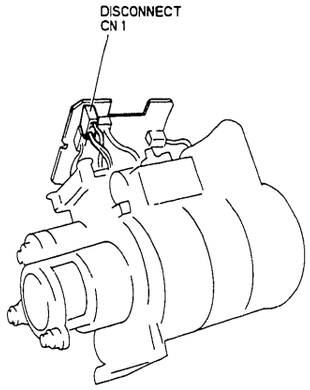


Fig. 2-115 Zoom Motor Removal

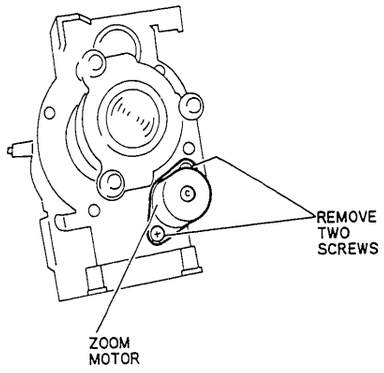


Fig. 2-116 Zoom Motor Removal

Focus Motor Removal (Figs. 2-117, 2-118)

1. Remove the lens block as previously given.
2. Remove the autofocus circuit board. (See Figs. 2-112, 2-113, 2-114)
3. Remove two (2) screws. (See Fig. 2-117)
4. Remove one (1) screw. (See Fig. 2-118)

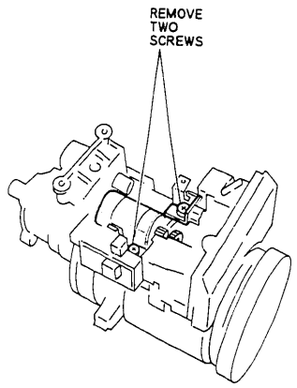


Fig. 2-117 Focus Motor Removal

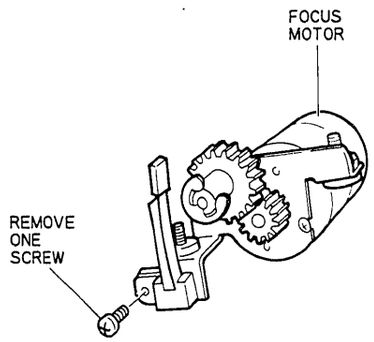


Fig. 2-118 Focus Motor Removal

Focus Switch Removal (Fig. 2-119)

1. Remove the lens block as previously given.
2. Open the autofocus circuit board. (See Fig. 2-113)
3. Disconnect connector CN3. (See Fig. 2-119)
4. Remove (2) screws holding the focus switch.

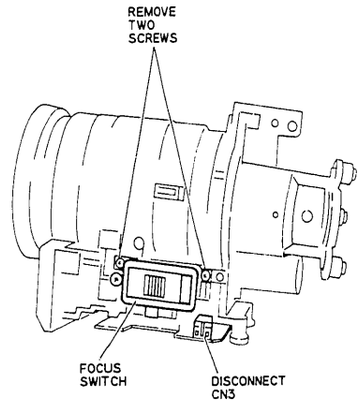


Fig. 2-119 Focus Switch Removal

Iris Block Removal (Figs. 2-120, 2-121)

1. Remove the lens block as previously given.
2. Open the autofocus circuit board. (See Fig. 2-113)
3. Disconnect connector CN1. (See Fig. 2-115)
4. Remove five (5) screws holding the relay lens block. (See Fig. 2-120)
5. Remove three (3) screws holding the iris block. (See Fig. 2-121)

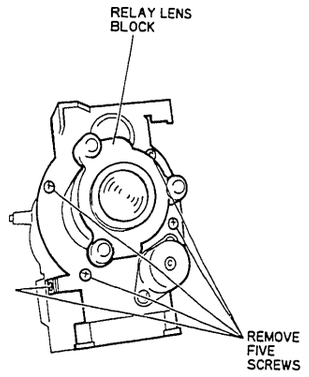


Fig. 2-120 Iris Block Removal

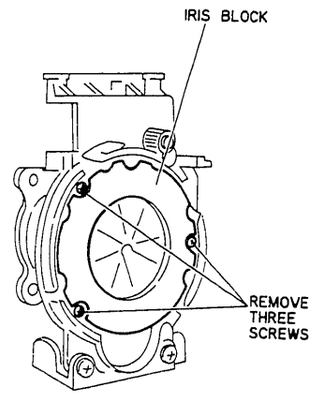


Fig. 2-121 Iris Block Removal

ELECTRONIC VIEWFINDER (EVF)

Remove the electronic viewfinder (EVF) as previously given.

Bottom Cover Removal (Fig. 2-122)

1. Turn the microphone ring in the direction of the arrow. (See Fig. 2-122)
2. Remove five (5) screws and open the bottom cover in the direction of the arrow.

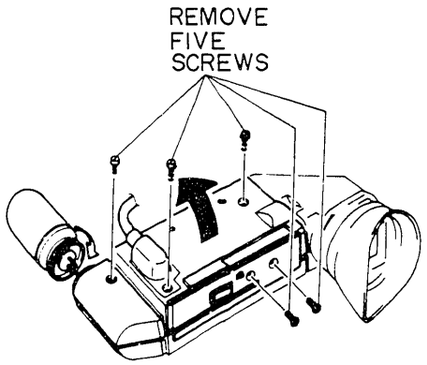


Fig. 2-122 Bottom Cover Removal

Electronic Viewfinder (EVF) Circuit Board Removal (Figs. 2-123, 2-124)

1. Remove the bottom cover. (See Fig. 2-122)
2. Pull out the electronic viewfinder (EVF) circuit board, CRT and mic jack circuit board in the direction of the arrow. (See Fig. 2-123)
3. Disconnect two (2) connectors (CN1023, CN1803) and CRT socket. (See Fig. 2-124)

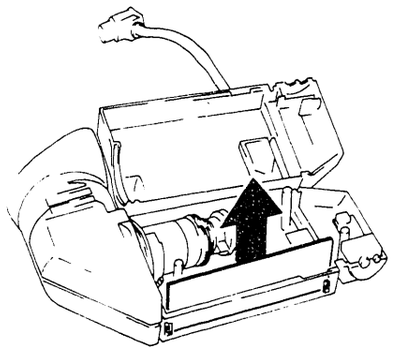


Fig. 2-123 Electronic Viewfinder (EVF) Circuit Board Removal

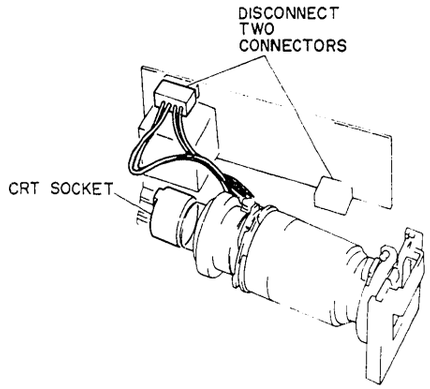


Fig. 2-124 Electronic Viewfinder (EVF) Circuit Board Removal

Mic Jack Circuit Board Removal (Fig. 2-125)

1. Remove the bottom cover. (See Fig. 2-122)
2. Disconnect connector CN1023. (See Fig. 2-125)

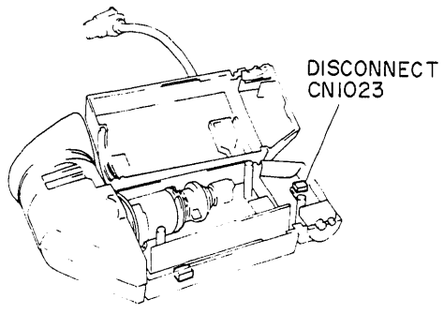


Fig. 2-125 Mic Jack Circuit Board Removal

CRT Removal (Figs. 2-126, 2-127)

1. Remove the bottom cover. (See Fig. 2-122)
2. Remove the EVF circuit board. (See Figs. 2-123, 2-124)
3. Press the CRT top cover to release the locking tabs and CRT top cover. (See Fig. 2-126)
4. Remove the indication circuit board and CRT frame in the direction of the arrow. (See Fig. 2-127)
5. Remove one (1) screw holding the deflection coil.
6. Remove the deflection coil in the direction of the arrow.

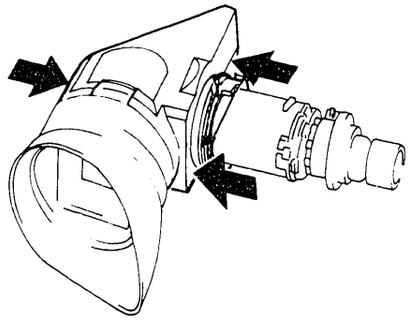


Fig. 2-126 CRT Removal

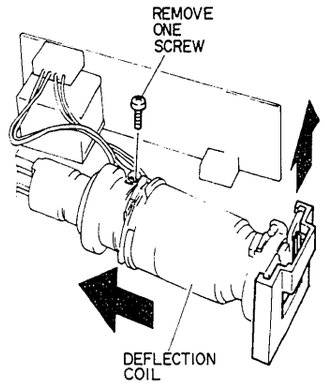
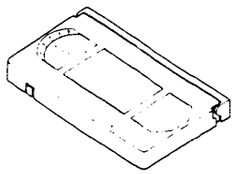
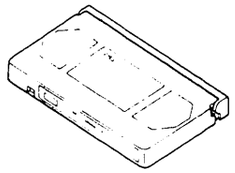
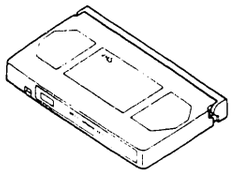
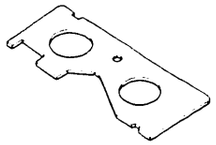
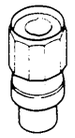
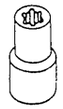
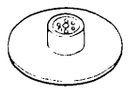
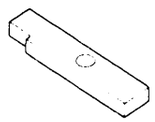
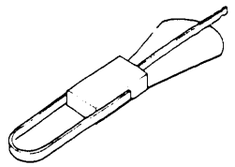
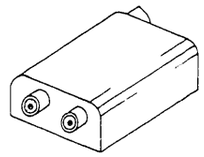
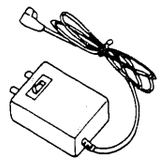
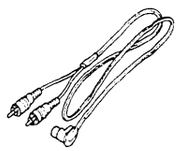


Fig. 2-127 CRT Removal

ADJUSTMENT

SERVICING JIGS AND TOOLS

1. Back Tension Meter Parts No. 7099004 	2. NTSC Alignment Tape Parts No. 7099046 	3. 30 HMP-2 Parts No. 7099089 
4. Master Plane Parts No. 7099041 	5. Torque Gauge Parts No. 7099039 	6. Torque Gauge Adapter Parts No. 7099204 
7. Dummy Reel Parts No. 7099043 	8. Reel Disk Height Jig Parts No. 7099038 	9. 0.9 mm Hexagonal Wrench
10. Fan Type Tension Gauge 	11. AV Input Adapter VM-CH20A 	12. RF Converter Unit VM-RF20A 
13. AV Output Cable VM-CH25A 		

Service Parts

No.	MODEL	PARTS No.
11	VM-CH20A	5659991
12	VM-RF20A	7095042
13	VM-CH25A	5855161

MECHANICAL ADJUSTMENT

1. MECHANISM STATE SWITCH ADJUSTMENT

Loading Cam Gear (Supply/Take-up) Adjustment (Fig. 3-1)

Be sure to perform this adjustment after replacing the Loading Cam Gear (Supply/Take-up), before adjusting the Mechanism State Switch.

1. Check that marking (1) on the supply loading cam gear and the marking on the take-up loading gear aligned. If they are not aligned, reassemble the loading cam gears.

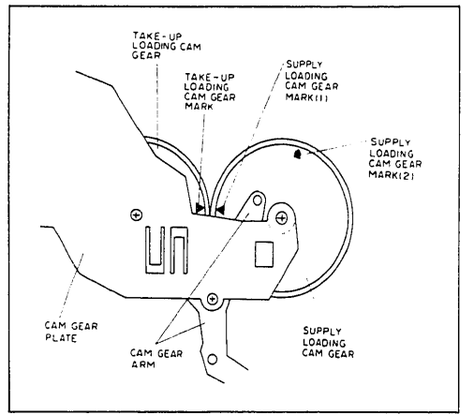

TAKE-UP LOADING CAM GEAR
TAKE-UP LOADING CAM GEAR MARK
SUPPLY LOADING CAM GEAR MARK(1)
SUPPLY LOADING CAM GEAR MARK(2)
CAM GEAR PLATE
CAM GEAR ARM
SUPPLY LOADING CAM GEAR

Fig. 3-1

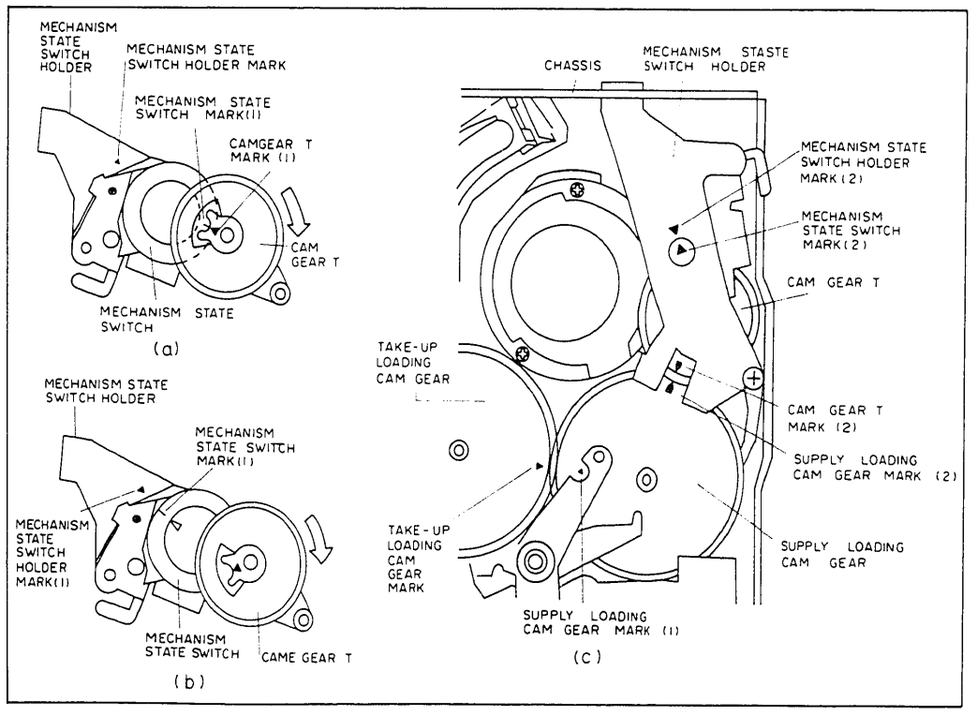


Fig. 3-2

Mechanism State Switch Adjustment (Fig. 3-2)

Be sure to perform this adjustment after replacing the rmechanism state switch and loading cam gears (supply/take-up).

1. Assemble the mechanism state switch and cam gear T so marking (1) on the mechanism state switch and marking (1) on cam gear T are aligned. (See Fig. 3-2 (A))
2. Turn cam gear T in the direction of the arrow so that marking (1) on the mechanism state switch and marking (1) on the switch holder are aligned. (See Fig. 3-2 (B))
3. Check that the loading cam gear adjustment is performed correctly.
4. Assembly the mechanism state switch holder into the chassis so that marking (2) on cam gear T and marking (2) on the supply loading cam gear are aligned.
   Check that marking (2) on the mechanism state switch and marking (2) on the switch holder are aligned at this time. (See Fig. 3-2 (C)) If they are not aligned, readjust the mechanism state switch.

2. TAPE TRANSPORT SYSTEM COMPONENTS CHECK/ ADJUSTMENT

The tape transport system is the path from the supply reel to the take-up reel via the video head. The tape transport components, especially the components which come into direct contact which the tape, should be tape kept clean without damage, dust and oil, etc. adhering to the contact surfaces. The tape transport system is adjusted before shipment from the factory, so when any transport components are replaced, the transport system is stabilized by correctly adjusting the new components.

Reel Disk Height Adjustment (Fig. 3-3)

1. Remove the cassette lid, left case and mount the master plane.
2. Place a reel disk height jig on the master plane and fit it to the reel disk.
3. Check that the top of the reel disk is positioned between sections A and B of the reel disk height jig.
4. When the top of the reel disk is positioned between section A and B, adjust the number of the spacers (2 types: 0.25 mm and 0.5 mm in thick) at the bottom of the reel disk.

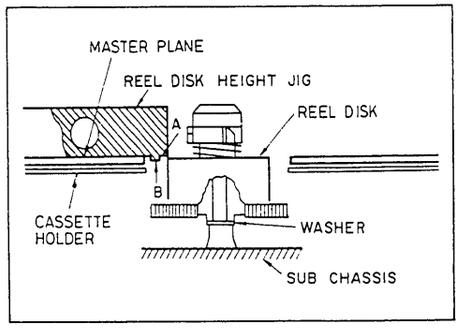


Fig. 3-3

Tension Pole Position/Tension Adjustment

Position Adjustment (Fig. 3-4)

1. Set the tension spring to position "B" on the spring holder.
2. Cover up the supply tape-sensor photocell located midway on the left side of the tape mechanism.
3. Place instrument in the "play" mode.
4. After loading is complete, loosen the screw holding the tension band holder. Then, slide the holder and adjust so that the clearance between section A of the supply end sensor holder and the tension arm is 1.4 to 2.0 mm.
5. Tighten screw to secure adjustment.

Tension Adjustment (Fig. 3-4)

1. Load the instrument with the back tension adjustment tape.
2. Place the instrument in the "play" mode.
3. Read the scale on the supply reel.
4. This reading should be between 27 and 38.
5. Move the tension arm spring to the position "A" on the spring holder when the tension adjustment tape reads 39 or higher, and to the position "C" on the spring holder when it is 26 or lower, and adjust the back tension for a nominal reading of 27-38 on the scale.
6. Recheck the tension arm position when the back tension is changed greatly (5 or more).

Note: The instrument must be in a horizontal position for this adjustment.

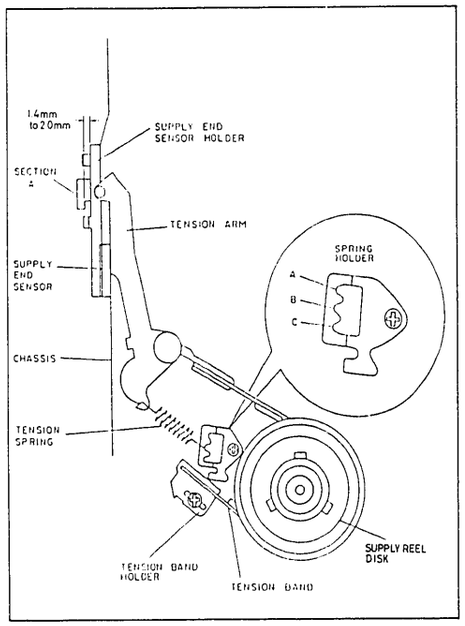


Fig. 3-4

Impedance Roller Height Adjustment (Fig. 3-5)

1. Remove the cassette lid, left case and mount the master plane.
2. Place a reel disk height jig on the master plane and fit it to the impedance roller.
3. Turn the impedance roller height adjusting nut so that the gap between the top of the impedance roller and the top of the jig is 1.5 mm to 2.5 mm.
4. Run the blank tape and check that the tape runs along the lower edge. If not, adjust the height adjusting nut of the impedance roller so the tape does run along the lower edge.

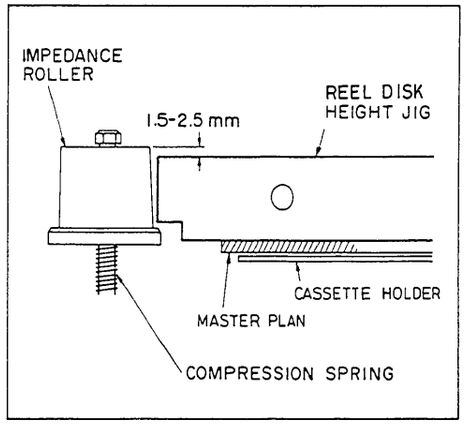


Fig. 3-5

Guide Pole Height Adjustment (Fig. 3-6)

1. Remove the cassette lid, left case and mount the master plane.
2. Place a reel disk height jig on the master plane and fit it to the guide pole.
3. Turn the guide pole height adjusting nut so that the gap between the upper flange of the guide pole and the top of the jig is 0.1 mm±0.1 mm.
4. Load a blank tape, run it and check that the tape does not ride over the upper and lower flanges of the ple.

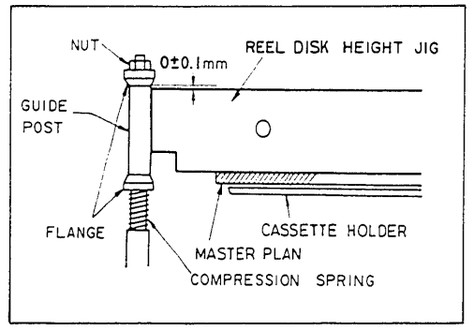


Fig. 3-6

Guide Roller Height Adjustment (Figs. 3-7, 3-8)

1. Remove the cassette lid, left case and mount the master plane.
2. Place a reel disk height jig on the master plane and fit it to the guide roller.
3. Tighten the guide roller fixing screw at the position where the upper flange of the guide roller and the top of the jig match.
4. Run the tape and check that the tape does not curl and ride over, and then perform the electrical adjustment.
5. Connect the oscilloscope to TP204 on the main board.
6. Playback the color bar test tape and set the tracking control (RV101) to the click position.
7. Check that the FM waveform is flat.
8. Then check that the FM drops at the start and end of the envelope are equal when the tracking control is turned to the left and right.
9. When the FM drops at the start and of the envelope are not equal, loosen the guide roller fixing screw, turn the guide roller a little to the left and right so that they are equal.
10. Tighten the fixing screw.

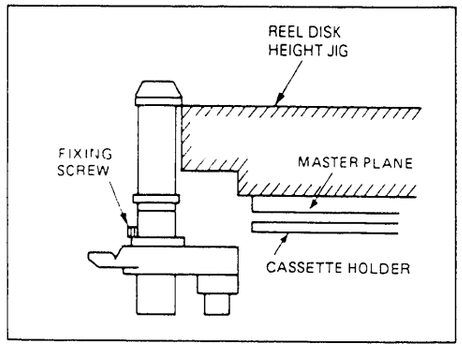


Fig. 3-7

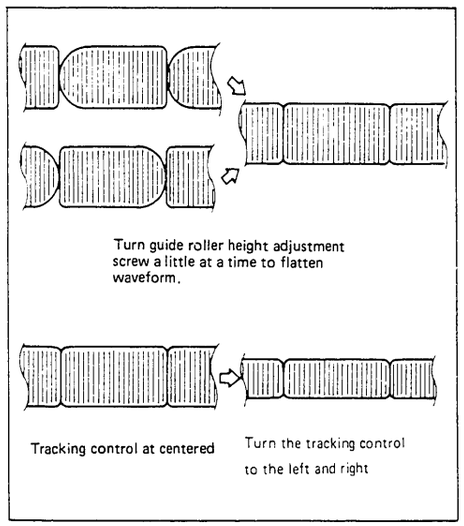

Turn guide roller height adjustment screw a little at a time to flatten waveform.
Tracking control at centered
Turn the tracking control to the left and right

Fig. 3-8

A/C Head Adjustment (Figs. 3-9, 3-10, 3-11)

Perform the height, tilt and azimuth adjustments repeatedly to determine the A/C head installation position, then adjust X value.
Detailed adjustment below is the procedure when the A/C head is replaced; be sure to do precise adjustment after rough adjustment.

Rough Adjustment (Fig. 3-9)

1. Remove the cassette lid and left case before making adjustment.
2. Check that it is 2.5 – 3 mm between the top of Nut (A) and point of the shaft. If it is not, adjust Nut (A).
3. Install the height reference plate in its proper position.
4. Adjust Azimuth Screw (B), Tilt Screw (C) and Screw (F) so the height difference between the height reference plate and A/C head base (1) is 1 – 2 mm and A/C head bases (1) and (2) are parallel.

Precise Adjustment (Figs. 3-9, 3-10)

5. Connect the oscilloscope to PG903-6 on the main board.
6. Playback a 7 kHz audio signal on alignment tape.
7. Adjust azimuth screw (B) and tilt screw (C) for maximum output.

X value Adjustment (Figs. 3-9, 3-11)

8. Connect the oscilloscope to TP204 on the main board.
9. Trigger the oscilloscope at SW30 Hz. (Use TP202 on the main board)
10. Set the Tracking control (RV101) to the click (fixed) position.
11. Loosen two (2) screws (D and E).
12. Playback a alignment tape.
13. Carefully move the A/C head base plate in either direction for maximum head envelope output by adjusting the X-value adjust point.
14. Lock two (2) screws (D and E) with paint.

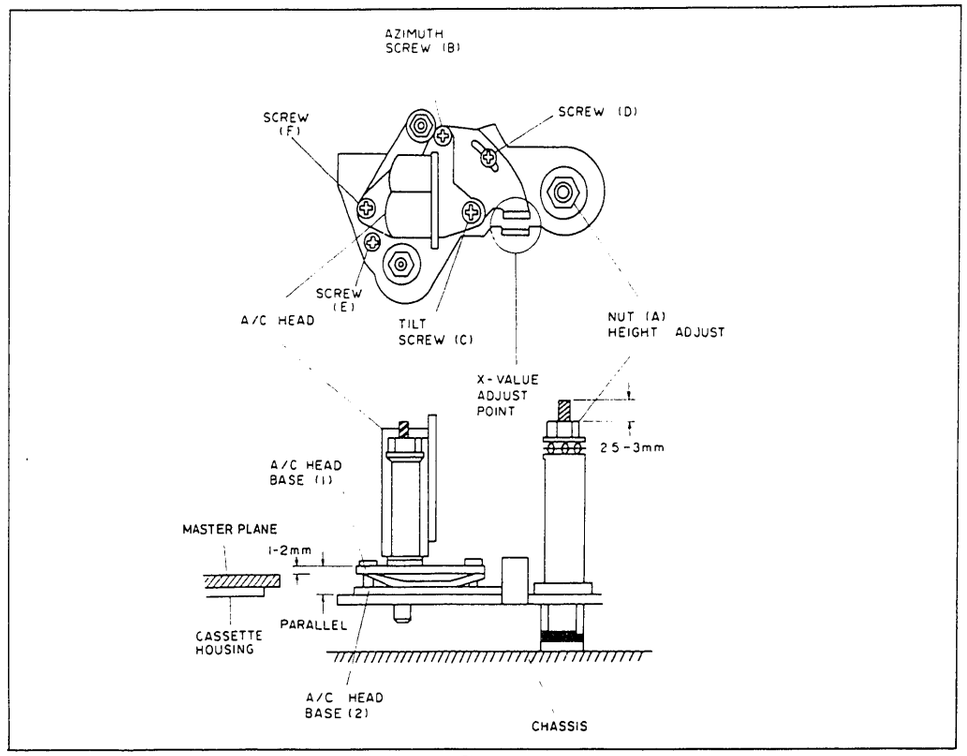


Fig. 3-9

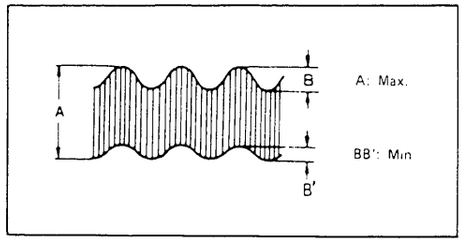


Fig. 3-10

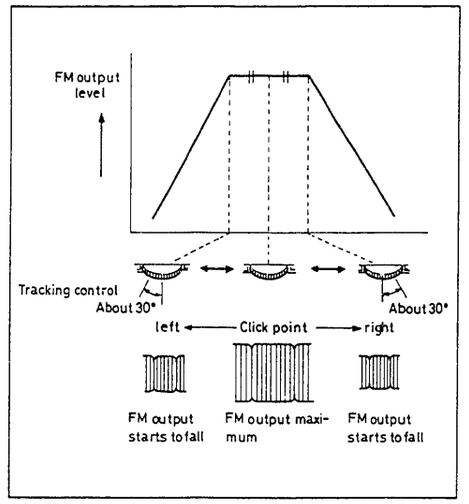


Fig. 3-11

Adjustment After Replacing Cylinder (Video Head)

When the cylinder is replaced, the relative height between the cylinder and guide roller and the X value, etc. drift, so adjustments of the tape transport system and servo system are required.
However, the drifts in the relative height and X value are very little when the cylinder is replaced normally, so they can be corrected by electrical adjustments.

1. Check that no curl or crease occurs around the guide roller. Adjust the guide roller height when they occur.
2. Perform tracking preset adjustments (Servo section).
3. Adjust the X value (described in "A/C Head Adjustment").
4. Check the flatness and level fluctuations of the FM output. The checking method is described later.
5. Adjust the servo section and Y/Chroma section.
   * Head Switching Point Adjustment
   * Tracking Preset Adjustment
   * Record Luminance Level Adjustment
   * Record Chroma Level Adjustment

Check Flatness and Level Fluctuations of the FM Output (Fig. 3-12)

1. Set the tracking control to the click position.
2. Fine adjust the voltage level range of the oscilloscope and set the FM output to 4 graduations.
3. Turn the tracking control to set the maximum amplitude of the FM output to 3 graduations.
4. Check that the minimum amplitude is more than 2 graduations.
5. Check that the level difference between the maximum and minimum amplitudes is less than 13%.

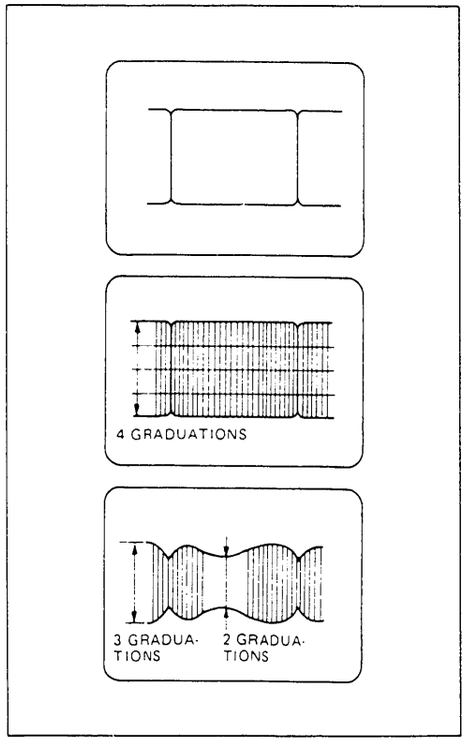


Fig. 3-12

3. TENSION AND TORQUE CHECKS (Fig. 3-13)

It is necessary to check the tension, torque and compression strength in the tape take-up section and moving section to smoothen the tape transport and to satisfy the basic performance of the VCR. When the tape transport is not smooth or the tape speed is abnormal detect the faulty section by this checking, and then check again after replacing the faulty parts with normal ones to complete the work.

Item	VTR Operation Mode	Measured Reel	Measurement Value	Remarks
Main brake torque	STOP	Supply	140g.cm ~	Note 1
		Take-up	80g.cm ~	
Slack removal torque	UNLOADING	Supply	90~ 220g.cm	Note 1
Fast forward torque	F. FWD	Take-up	400g. cm~	Note 1
Rewind torque	REW	Supply	400g. cm ~	Note 1
Take-up torque	PLAY	Take-up	80 ~ 110 g. cm	Note 1
Back-tension torque	F. FWD	Supply	4 ~10g. cm	Note 2
	REW	Take-up		

Note 1:
This is the value measured using the torque gauge and torque adapter while sliding the torque gauge at the speed of 0.8 rps. However, the main brake torque shows the value measured while moving the take-up reel clockwise and the supply reel counterclockwise by hand at the speed of 0.8 rps.

Note 2:
This is the value measured using the dummy reel and fan type tension gauge while drawing the take-up reel disk counterclockwise and the supply reel disk clockwise at the speed of 50 mm/s.

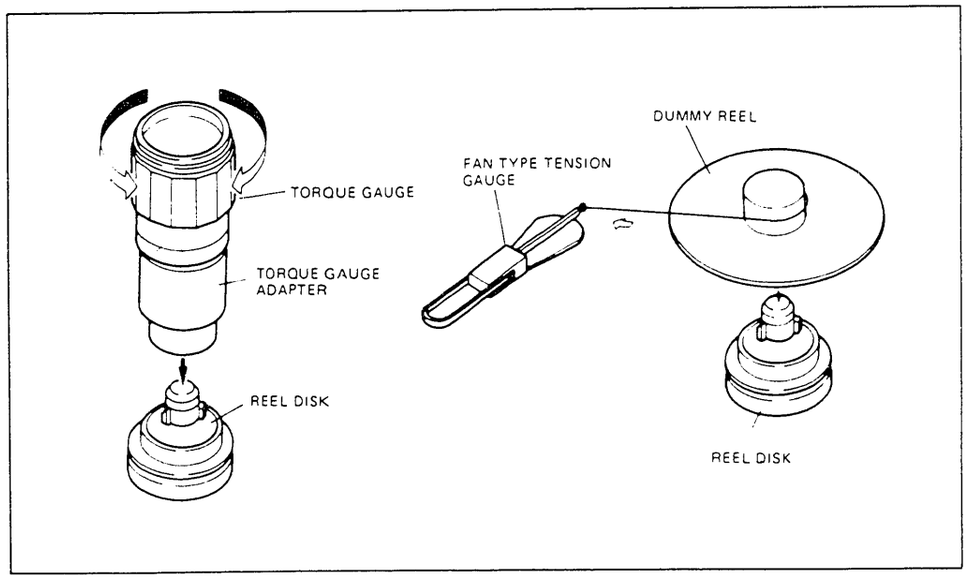


Fig. 3-13

ELECTRICAL ADJUSTMENT

CONTENTS

CORRECT SETUP VHS MOVIE ADJUSTMENT 49
CIRCUIT BOARDS LOCATION AND IDENTIFICATION 49

CAMERA SECTION

TEST EQUIPMENT REQUIRED 53
ADJUSTMENT CONDITIONS 53

CAMERA ADJUSTMENT

- Drive Pulse Frequency Adjustment 53
- Backfocus Adjustment 53
- Subcarrier Frequency Adjustment 54
- White Balance Control Position Adjustment 54
- Flutter Cancel Adjustment 54
- Carrier Leak Cancel Adjustment 55
- Shading Adjustment 56
- Red/Blue/Green Setup Adjustment 56
- Red/Blue Signal Gain Adjustment 57
- Horizontal Transient Adjustment 58
- AIC Level Adjustment 58
- Burst Level Adjustment 58
- Chroma Level Adjustment 59
- Auto White Balance Adjustment 60
- Clock Frequency Adjustment 60

ELECTRONIC VIEWFINDER ADJUSTMENT

- EVF Horizontal Hold Adjustment 60
- EVF Focus Adjustment 61
- EVF Picture Tilt Adjustment 61
- EVF Centering Adjustment 61
- EVF Vertical Size Adjustment 61
- EVF Contrast and Brightness Adjustment 61

AUTOFOCUS ADJUSTMENT

- Autofocus Offset Adjustment 61
- Autofocus Gain Adjustment 62
- Autofocus Offset Confirmation 62
- Autofocus Sensor Position Adjustment 62

VTR SECTION

COMPONENT BOARDS LOCATION AND IDENTIFICATION 63

MAIN CIRCUIT (SWITCHING REGULATOR SECTION)

- 5V Adjustment 64
- Overdischarge Level Adjustment 64
- Character Position Adjustment 64

MAIN CIRCUIT (SERVO SECTION)

- Cylinder Motor Speed Adjustment 64
- Capstan Motor Speed Adjustment 65
- 30 Hz Reference Frequency Adjustment 65
- Head Switching Point Adjustment 66
- Tracking Preset Adjustment 66

MAIN CIRCUIT (LUMA/CHROMA SECTION)

- Luminance/Chroma Separation Adjustment 67
- Record Chroma Level Adjustment 67
- Record Luminance Level Adjustment 68

AUDIO CIRCUIT

- Audio Playback Gain Adjustment 68
- Audio Bias Level Adjustment 68

SERVICE POSITION

CORRECT SETUP VHS MOVIE ADJUSTMENT

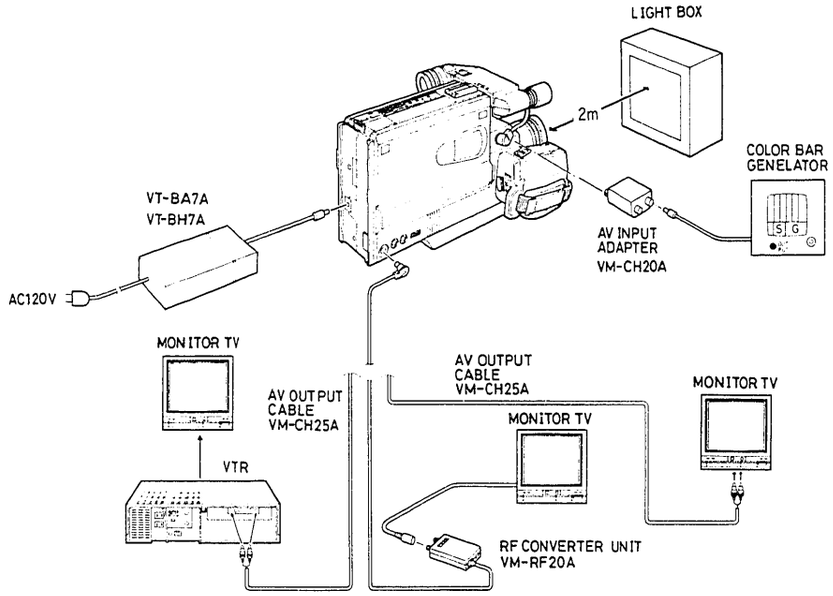
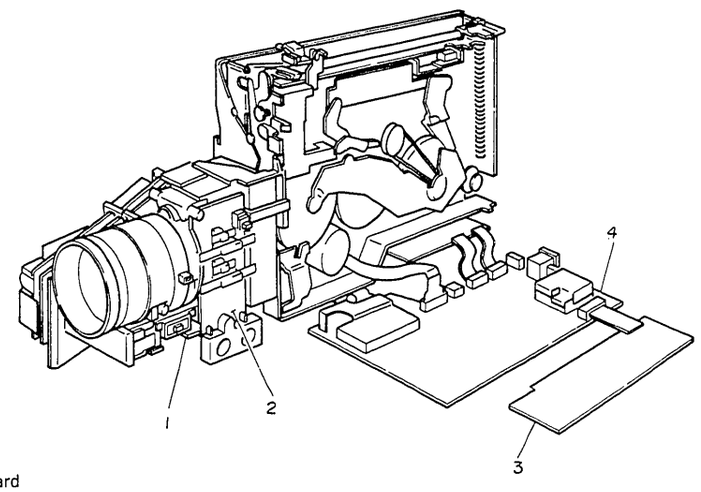


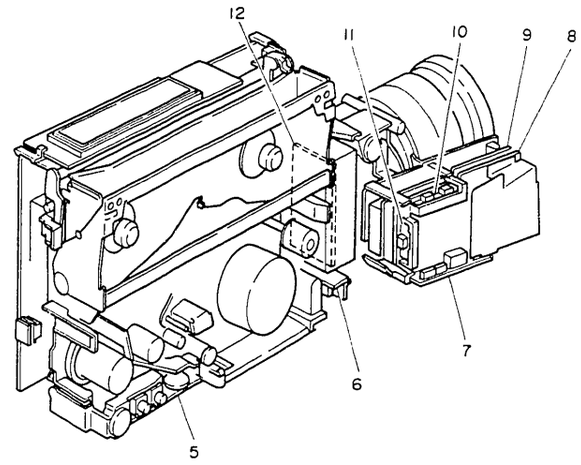
Fig. 4-1 Correct Setup VHS MOVIE Adjustment

CIRCUIT BOARD LOCATION AND IDENTIFICATION (CAMERA SECTION)



1. Autofocus Circuit Board
2. Control Circuit Board
3. Function Switch Circuit Board
4. Main Circuit Board

Fig. 4-2 Boads Location



5. Audio Circuit Board
6. Regulator Circuit Board
7. Wiring Circuit Board
8. Encoder Circuit Board
9. Process Circuit Board
10. Zoom Switch Circuit Board
11. VTR REC Switch Circuit Board
12. Sensor Circuit Board

Fig. 4-3 Boards Location

Fig. 4-4 Sensor Circuit Board (Solder Side)

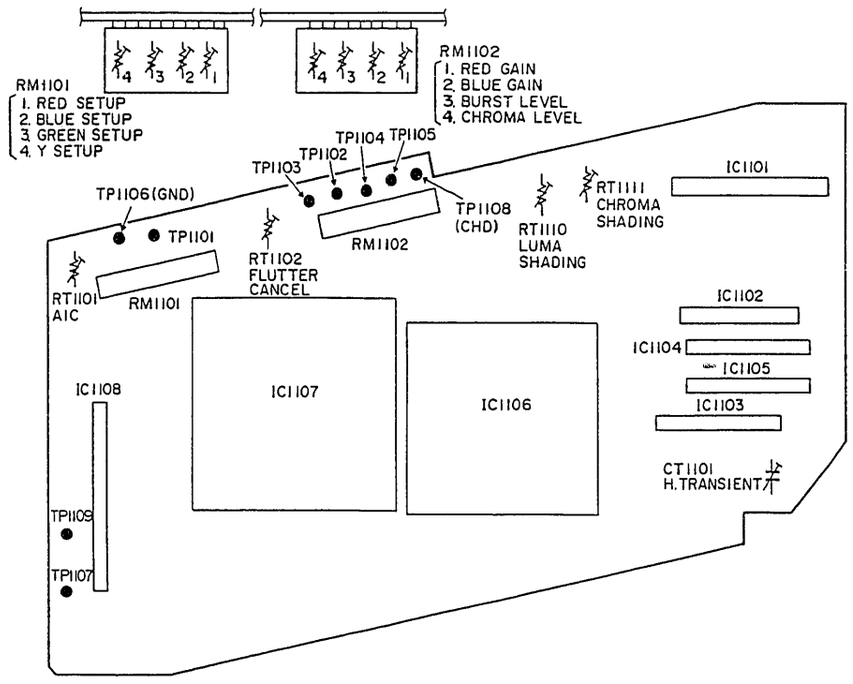


Fig. 4-5 Process Circuit Board (Component Side)

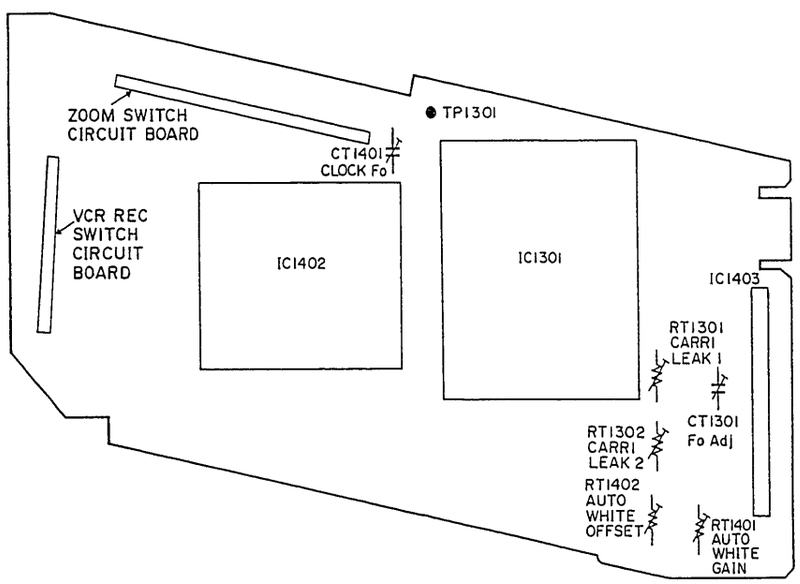


Fig. 4-6 Encoder Circuit Board (Component Side)

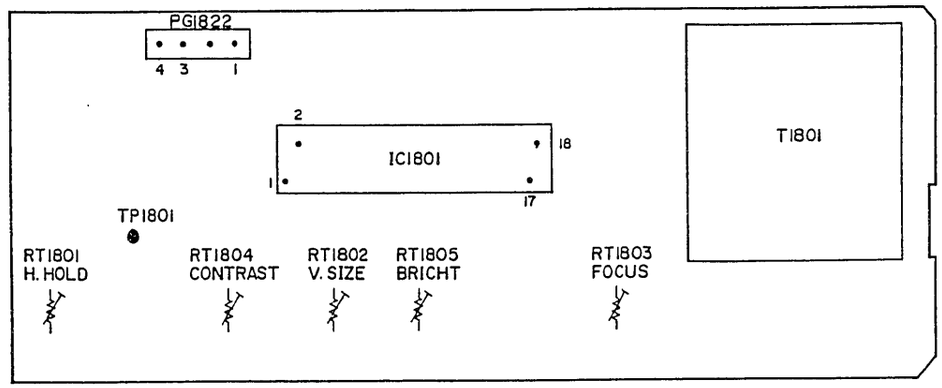
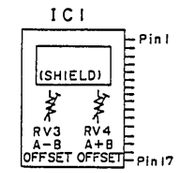


Fig. 4-7 Electronic Viewfinder Circuit Board (Component Side)



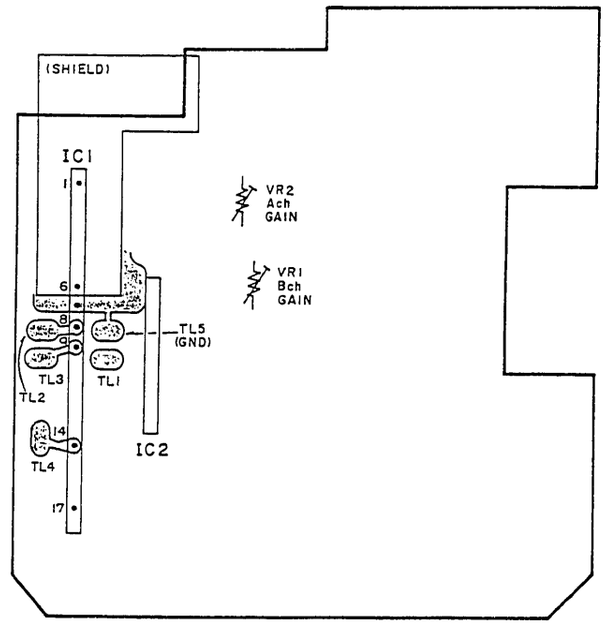


Fig. 4-8 Autofocus Circuit Board (Solder Side)

CAMERA SECTION

TEST EQUIPMENT REQUIRED

The following equipment is required for adjustment of the VHS MOVIE

Oscilloscope
(dual trace, 10:1 probe)
Digital Voltmeter (DVM)
Frequency Counter
Vectorscope
Color Video Monitor
Gray Scale Chart with 10
3200 degrees K Light Box
Color Bar Chart
Waveform Monitor
Light Meter

ADJUSTMENT CONDITIONS

Setting Up

Connect the camera and proper test equipment as shown in Fig. 4-1.

Allow the VHS MOVIE and test equipment to warm up for at least 30 minutes prior to making adjustments.

Aim the camera at the chart fully over the video period when otherwise not specified.

Preset Position of Customer Controls and Switches

POWER switch . . . . . ON
VTR/CAMERA switch . . . . . CAMERA position
WHITE BALANCE control . . . . . Light Bulb position
IRIS SWITCH . . . . . MANUAL position
IRIS control . . . . . AUTO position
WHITE BALANCE switch . . . . . MANUAL position
FOCUS switch . . . . . MANUAL position

CAMERA ADJUSTMENTS

Drive Pulse Frequency Adjustment (Fig. 4-4)

Test Point: TP1001 Sensor
Adjust: CT1001 (DRIVE CLOCK Fo) "
Observe: DVM

This adjustment sets the drive pulse frequency to the specified value.

1. Connect the DVM to TP1001.
2. Adjust DRIVE CLOCK Fo control (CT1001) for 2.0 volts±0.1 volts.

Note: Be careful when applying an adjustment driver to CT1001 because the stray capacitance of the driver may vary the voltage.

Backfocus Adjustment (Figs. 4-10, 4-11)

Adjust: SENSOR BLOCK SCREW 1
SENSOR BLOCK SCREW 2
SENSOR BLOCK SCREW 3
LENS FOCUS RING
Observe: Color Monitor

The purpose of this adjustment is to ensure proper focus tracking throughout the zoom range.

1. Disassemble the camera section and position it as shown Fig. 4-11. (Remove two (2) screws holding the camera section and VTR section. (See Fig. 2-33))
2. Position the camera section two (2) meters from the backfocus chart and illuminate the object with approximately 100 lux.
3. Set the zoom ring to the wide angle position and the focus ring to the two (2) meter position.
4. Turn the three (3) sensor block screws fully clockwise, and then turn them counterclockwise by approximately three (3) turns.
5. Aim the camera at the points on the chart and position them in the section A on the monitor screen.
6. Adjust SENSOR BLOCK SCREW 1 for the best focus of section A.
7. Position the points of the chart in section B on the monitor screen and adjust SENSOR BLOCK SCREW 2 for the best focus of section B.
8. Position the points of the chart in section C on the monitor screen and adjust SENSOR BLOCK SCREW 3 for the best focus of section C.
9. Repeat steps five through nine as necessary to obtain the best settings between 1.5 and 3.1 on the lens focus ring.

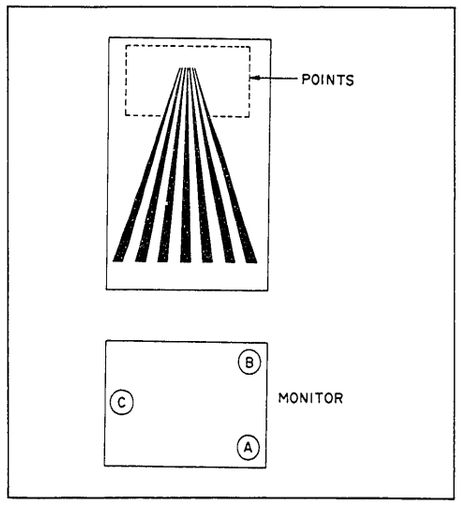


Fig. 4-10 Backfocus Adjustment

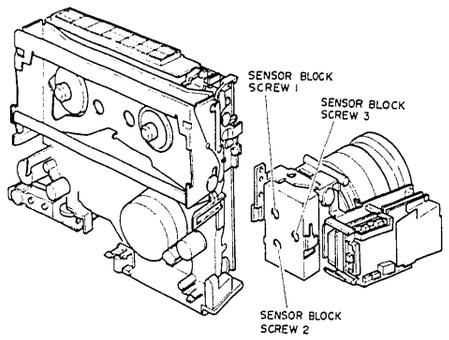


Fig. 4-11 Backfocus Adjustment

Subcarrier Frequency Adjustment (Fig. 4-6)

Test Point:	TP1301	Encoder
Adjust:	CT1301 (Fo Adj.)	"
Observe:	Frequency Counter	

Misadjustment of the subcarrier oscillator can cause color loss, no color, and tint problems.

1. Connect the frequency counter to TP1301.
2. Adjust Fo Adj. control (CT1301) for 3.579545 MHz ±20 Hz.

Note: Be careful when applying an adjustment driver to CT1301 because the stray capacitance of the driver may vary the frequency.

White Balance Control Position Adjustment (Fig. 4-5)

Test Point:	TP1101	Process
Adjust:	WHITE BALANCE control	Left side of the case
Observe:	DVM	

1. Confirm that the WHITE BALANCE switch is in the MANUAL position.
2. Connect the DVM to TP1101.
3. Adjust WHITE BALANCE control, located on the left side of the case, for 1.4 0.05.

Flutter Cancel Adjustment (Figs. 4-5, 4-12, 4-13)

Test Point:	Video Out (NTSC OUT)	
Adjust:	RT1102 (FLUTTER CANCEL)	Process
Observe:	Vectorscope	
	Oscilloscope	

This adjustment minimizes the flutter on the monitor screen.

- Adjustment using vectorscope

1. Cap the lens.
2. Connect the video out terminated vectorscope. (Terminate with 75 ohms.)
3. Adjust FLUTTER CANCEL control (RT1102) so that the carrier in the vector is minimum. (See Fig. 4-12)

- Adjustment using oscilloscope

1. Connect an oscilloscope to the video output jack.
2. Trigger the oscilloscope with TP1108 (CHD).
3. Adjust FLICKER CANCEL control (RT1102) to minimize the carrier on the waveform. (See Fig. 4-13)

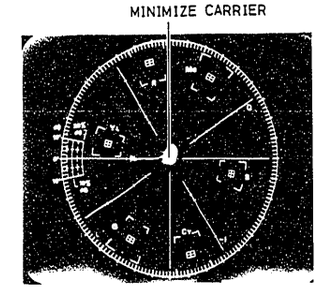


Fig. 4-12 Flutter Cancel Adjustment

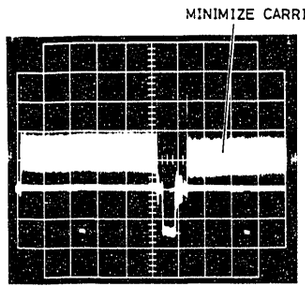


Fig. 4-13 Flutter Cancel Adjustment

Carrier Leak Cancel Adjustment (Figs. 4-6, 4-14, 4-15, 4-16, 4-17)

Test Point:	Video Out (NTSC OUT)	
Adjust:	RT1301 (CARRI LEAK 1)	Encoder
	RT1302 (CARRI LEAK 2)	"
Observe:	Vectorscope	
	Oscilloscope	

This adjustment minimizes the carrier leak of encoder IC (IC1301).

- Adjustment using vectorscope

1. Aim the camera at the color bar chart.
2. Connect the video out terminated vectorscope. (Terminate with 75 ohms.)
3. Connect TP1107 to ground (TP1106).
4. Turn the WHITE BALANCE control fully clockwise.
5. Adjust CARRI LEAK 1 control (RT1301) so the bright line and horizontal axis (X axis) are parallel on the vectorscope. (See Fig. 4-14)
6. Remove ground (TP1106) connection from TP1107.
7. Cap the lens.
8. Connect TP1109 to ground (TP1106).
9. Adjust CARRI LEAK 2 control (RT1302) so the bright point is placed on the vertical axis (Y axis) or center of the vectorscope. (See Fig. 4-15)
10. Remove ground (TP1106) connection from TP1109.

- Adjustment using oscilloscope

1. Aim the camera at the color bar chart.
2. Connect the oscilloscope to TP904. (See Fig. 4-101)
3. Trigger the oscilloscope at horizontal rate. (Use TP1108 on the process board.)
4. Connect TP1107 to ground (TP1106).
5. Adjust CARRI LEAK 1 control (RT1301) so that the carrier in the waveform is minimum. (See Fig. 4-16)
6. Remove ground (TP1106) connection from TP1107.
7. Cap the lens.
8. Connect TP1109 to ground (TP1106).
9. Adjust CARRI LEAK 2 control (RT1302) so that the carrier in the waveform is minimum. (See Fig. 4-17)
10. Remove ground (TP1106) connection from TP1109.

Note: After this adjustment is complete, readjust the White Balance Control Position Adjustment.

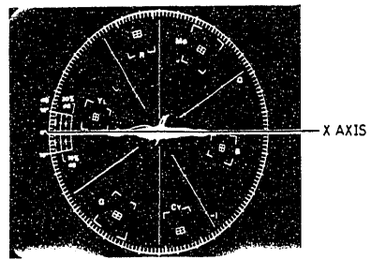


Fig. 4-14 Carrier Leak Cancel Adjustment

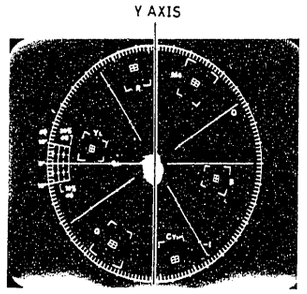


Fig. 4-15 Carrier Leak Cancel Adjustment

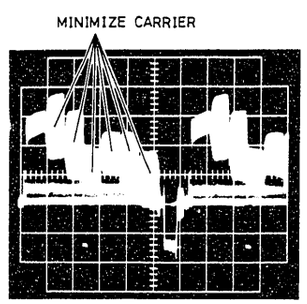


Fig. 4-16 Carrier Leak Cancel Adjustment

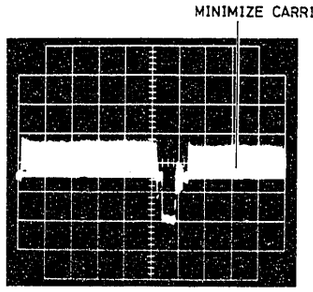


Fig. 4-17 Carrier Leak Cancel Adjustment

Shading Adjustment (Figs. 4-5, 4-18, 4-19, 4-20, 4-101)

Test Point:	Video Out (TP904)	MAIN(VTR)
Adjust:	RT1110 (LUMA SHADING)	Process
	RT1111 (CHROMA SHADING)	"
Observe:	Vectorscope	
	Oscilloscope	
	Monitor TV	

- Adjustment using vectorscope

1. Cap the lens.
2. Connect the oscilloscope to TP904 (See Fig. 4-101)
3. Trigger the oscilloscope at horizontal rate. (Use TP1108 on the process board.)
4. Adjust LUMA SHADING control (RT1110) to make the waveform flat. (See Fig. 4-18)
5. Connect the video out terminated vectorscope. (Terminate with 75 ohms.)
6. Set the GAIN control of vectorscope to maximum position.
7. Adjust CHROMA SHADING control (RT1111) so that the carrier in the vector is minimum. (See Figs. 4-19, 4-20)
8. Confirm that no color shading on monitor screen is obtained. If not, readjust this adjustment.

- Adjustment using oscilloscope and monitor TV

1. Cap the lens.
2. Connect the oscilloscope to TP904 (See Fig. 4-101).
3. Trigger the oscilloscope at horizontal rate. (Use TP1108 on the process board.)
4. Adjust LUMA SHADING control (RT1110) to make the waveform flat. (See Fig. 4-18)
5. Adjust CHROMA SHADING control (RT1111) so that the no color shading on monitor screen is obtained.

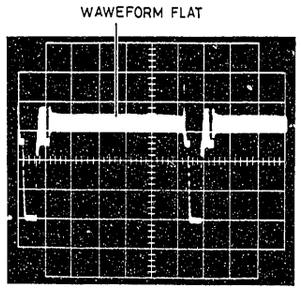
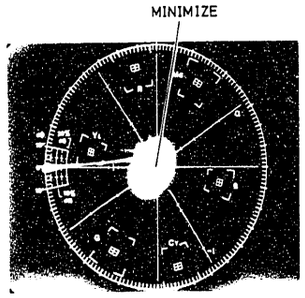
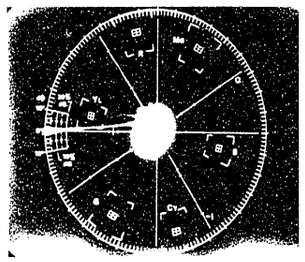


Fig. 4-18 Shading Adjustment



NO GOOD

Fig. 4-19 Shading Adjustment



GOOD

Fig. 4-20 Shading Adjustment

Red/Blue/Green Setup Adjustment (Figs. 4-5, 4-21, 4-22, 4-23, 4-101)

Test Point:	Video Out (NTSC OUT)	
Adjusts:	Video Out (TP904)	Main (VTR)
	RM1101-1 (RED SETUP)	Process
	RM1101-2 (BLUE SETUP)	"
	RM1101-3 (GREEN SETUP)	"
	RM1101-4 (Y SETUP)	"
Observe:	Vectorscope	
	Oscilloscope	

This adjustment sets the proper black balance of the picture.

- Adjustment using vectorscope

1. Cap the lens.
2. Connect the video out terminated vectorscope. (Terminate with 75 ohms.)
3. Connect TP1102 and TP1103 to ground (TP1106).
4. Adjust GREEN SETUP control (RM1101-3) so the bright portion of the vector is located as close as possible to the center of the vectorscope screen. (See Fig. 4-21)
5. Remove ground (TP1106) connections from TP1102 and TP1103.
6. Adjust RED SETUP control (RM1101-1) and BLUE SETUP (RM1101-2) so the bright portion of the vector is positioned in the center of the vectorscope screen. (See Fig. 4-21)
7. Connect the oscilloscope to TP904 (See Fig. 4-101)
8. Trigger the oscilloscope at horizontal rate. (Use TP1108 on the process board.)
9. Adjust Y SETUP control (RM1101-4) for 70 mVp-p ±7 mV from blanking to the center of the waveform. (See Fig. 4-23)

- Adjustment using oscilloscope

1. Connect an oscilloscope to the video output jack.
2. Trigger the oscilloscope with TP1108 (CHD).
3. Connect TP1102 and TP1103 on the process circuit board to GND (TP1106).
4. Adjust GREEN SETUP control (RM1101-3) to minimize the carrier on the waveform. (See Fig. 4-22)
5. Disconnect TP1102 and TP1103 from GND (TP1106).
6. Adjust RED SETUP control (RM1101-1) and BLUE SETUP control (RM1101-2) to minimize the carriers on the waveforms.
7. Connect an oscilloscope to the video output jack.
8. Trigger the oscilloscope with TP1108 (CHD).
9. Adjust Y SETUP control (RM1101-4) so the waveform 70 mVp-p± 7 mV. (See Fig. 4-23)

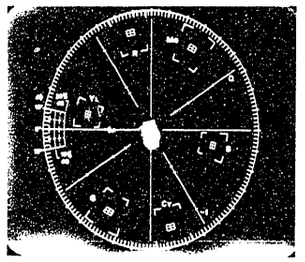


Fig. 4-21 Red/Balue/Green Setup Adjustment

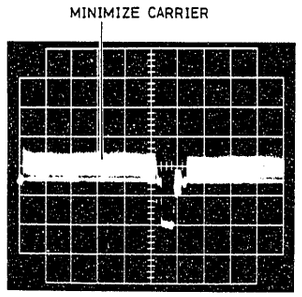


Fig. 4-22 Red/Blue/Green Setup Adjustment

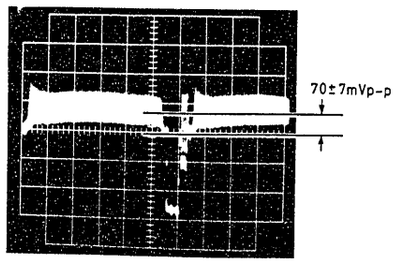


Fig. 4-23 Y Setup Adjustment

Red/Blue Signal Gain Adjustment (Figs. 4-5, 4-23, 4-24)

Test Point:	Video Out (NTSC OUT)	
Adjusts:	RM1102-1 (RED GAIN)	Process
	RM1102-2 (BLUE GAIN)	"
Observe:	Vectorscope	
	Oscilloscope	

This procedure sets the correct red and blue signal levels for proper white balance circuit operation.

- Adjustment using vectorscope

1. Aim the camera at the gray scale chart.
2. Connect the video out terminated vectorscope. (Terminate with 75 ohms.)
3. Adjust RED GAIN (RM1102-1) control and BLUE GAIN control (RM1102-2) so the bright portion of the vector is positioned in the center of the vectorscope screen. (See Fig. 4-24)

- Adjustment using oscilloscope

1. Connect an oscilloscope to the video output jack.
2. Trigger the oscilloscope with TP1108 (CHD).
3. Adjust RED GAIN control (RM1102-1) and BLUE GAIN control (RM1102-2) to minimize the carrier leaks at each step of the waveform. (See Fig. 4-25)

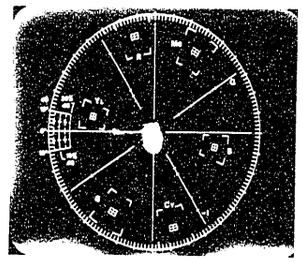


Fig. 4-24 Red/Blue Signal Gain Adjustment

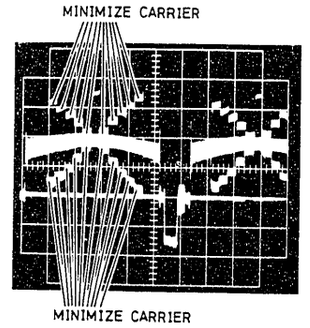


Fig. 4-25 Red/Blue Signal Gain Adjustment

Horizontal Transient Adjustment (Figs. 4-5, 4-26)

Test Point: Video Out (NTSC OUT)
Adjust: CT1101 (H. TRANSIENT) Process
Observe: Monitor TV

This adjustment minimizes the horizontal smear on the monitor screen when white changes to gray and gray changes to white.

1. Aim the camera at the gray scale chart.
2. Increase the COLOR GAIN control on the monitor to maximum.
3. Adjust H. TRANSIENT control (CT1101) to minimize the smear in the black to gray transitions and the white to gray transitions.

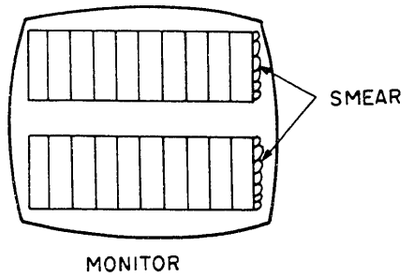


Fig. 4-26 Horizontal Transient Adjustment

AIC Level Adjustment (Figs. 4-5, 4-27, 4-101)

Test Point: Video Out (TP904) Main (VTR)
Adjust: RT1101 (AIC) Process
Observe: Oscilloscope

This adjustment sets the balance point of the auto iris control

1. Aim the camera at the gray scale chart.
2. Connect the oscilloscope to TP904. (See Fig. 401)
3. Trigger the oscilloscope at the horizontal rate. (Use TP1108 on the process board.)
4. Adjust AIC control (RT1101) for 714 mVp-p ±15 mV from blanking level to center of white level on the gray scale.

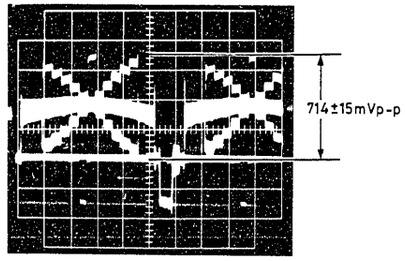


Fig. 4-27 AIC Level Adjustment

Burst Level Adjustment (Figs. 4-5, 4-28, 4-101)

Test Point: Video Out (TP904) Main (VTR)
Adjust: RM1102-3 (BURST LEVEL) Process
Observe: Oscilloscope

This adjustment sets the burst level.

1. Aim the camera at the gray scale chart.
2. Connect the oscilloscope TP904. (See Fig. 4-101)
3. Trigger the oscilloscope at the horizontal rate. (Use TP1108 on the process board.)
4. Adjust BURST LEVEL control (RM1102-3) for 280 mVp-p ± 15 mV to the burst level of gray scale waveform.

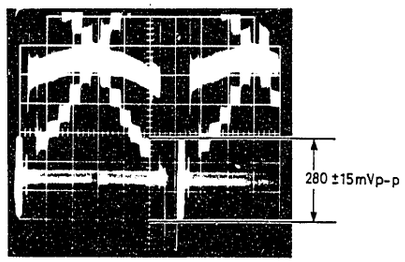


Fig. 4-28 Burst Level Adjustment

Chroma Level Adjustment (Figs. 4-5, 4-29, 4-30, 4-31, 4-32)

Test Point: Video Out (NTSC OUT)
Adjust: RM1102-4 (CHROMA LEVEL) Process
WHITE BALANCE control Left side of the case
Observe: Vectorscope
Oscilloscope

This adjustment sets the chroma level.

- Adjustment using vectorscope

1. Aim the camera at the gray scale chart.
2. Connect the video out terminated vectorscope. (Terminate with 75 ohms.)
3. Adjust WHITE BALANCE control so the bright portion of the vector is positioned in the center of the vectorscope screen. (See Fig. 4-29)
4. Aim the camera at the color bar chart.
5. Adjust CHROMA GAIN control (RM1102-4) so that the red vector is equal more than 220% ± 10% when compared to the burst level. (See Fig. 4-30)

- Adjustment using oscilloscope

1. Aim the camera at the gray scale chart.
2. Connect an oscilloscope to the video output jack.
3. Trigger the oscilloscope with TP1108 (CHD).
4. Adjust the white balance control to minimize the carriers at each step of the waveform. (See Fig. 4-31)
5. Set the IRIS switch to "MANUAL".
6. Aim the camera at the color bar chart.
7. Adjust the IRIS switch so the white level of the waveform is 600 mV.
8. Adjust (CHROMA LEVEL control (RM1102-4) so the red level of the waveform is 400 mV ±30 mV. (See Fig. 4-32)

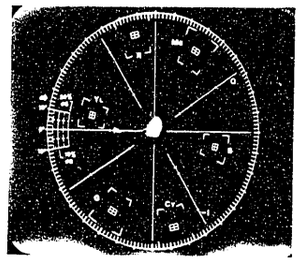


Fig. 4-29 Chroma Level Adjustment

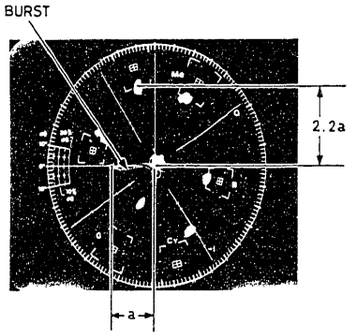


Fig. 4-30 Chroma Level Adjustment

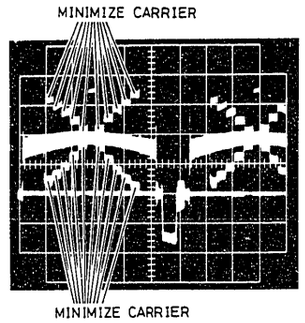


Fig. 4-31 Chroma Level Adjustment

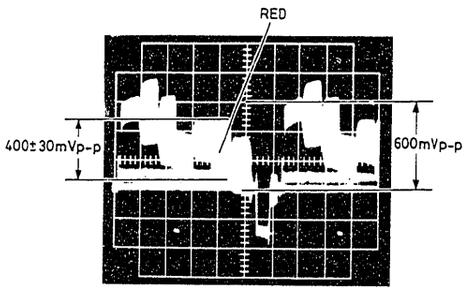


Fig. 4-32 Chroma Level Adjustment

Auto White Balance Adjustment (Figs. 4-6, 4-33)

Test Point: Video Out (NTSC OUT)
Adjusts: RT1401 (AUTO WHITE GAIN) Encoder
RT1402 (AUTO WHITE OFFSET) "
Observe: Vectorscope
Monitor TV

This adjustment sets the auto white balance performance.

- Adjustment using vectorscope

1. Set the WHITE BALANCE switch to AUTO position.
2. Adjust AUTO WHITE GAIN control (RT1401) to its mechanical center.
3. Connect the video out terminated vectorscope. (Terminate with 75 ohms.)
4. Aim the camera at a white object outdoors.
5. Set the zoom to the wide angle position.
6. Adjust AUTO WHITE OFFSET control (RT1402) so the bright portion of the vector is positioned in the center of the vectorscope screen.
7. Aim the camera at an incandescent light positioned five to ten feet away.
8. Adjust the AUTO WHITE GAIN control (RT1401) so the bright portion of the vector is positioned in the center of the vectorscope screen.
9. Perform the adjustment procedures 3 through 8 repeatedly until the bright portion of the vector remains in the center of the vectorscope screen. (See Fig. 4-33)

- Adjustment using monitor TV

1. Aim the camera at a white object outdoors.
2. Set the zoom to wide-angle.
3. Adjust AUTO WHITE OFFSET control (RT1402) so the white object outdoors is seen white on the monitor screen.
4. Aim the camera at an incandescent lamp (more than 100W) 1.5 to 3 m away.
5. Adjust AUTO WHITE GAIN control (RT1401) so the incandescent lamp is seen white on the monitor screen.

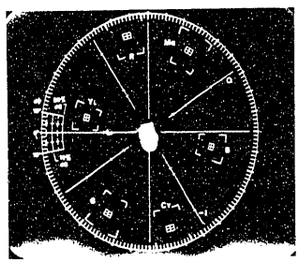


Fig. 4-33 Auto White Balance Adjustment

Clock Frequency Adjustment (Fig. 4-6)

Test Point: IC1402-9 Encoder
Adjust: CT1401 (CLOCK Fo) "
Observe: Frequency Counter

Note: Probe (10:1 and less than 20 pF)

1. Connect the frequency counter to IC1402-9.
2. Set the GATE switch of frequency counter to 10 sec position.
3. Adjust CLOCK Fo control (CT1401) for 32.7670 kHz ±0.1 Hz.

ELECTRONIC VIEWFINDER ADJUSTMENT

EVF Horizontal Hold Adjustment (Figs. 4-7, 4-34)

Test Point: TP1801 Electronic Viewfinder
Adjust: RT1801 (H. HOLD)

This procedure sets the horizontal sync frequency during VTR playback.

1. Connect the frequency counter to TP1801.
2. Set the H. HOLD control (RT1801) to its mechanical center.
3. Connect a 47 μF capacitor between pins 1 and 2 of PG1822.
4. Adjust H. HOLD (RT1801) for 15.75 kHz ±0.1 kHz.
5. Disconnect the capacitor.

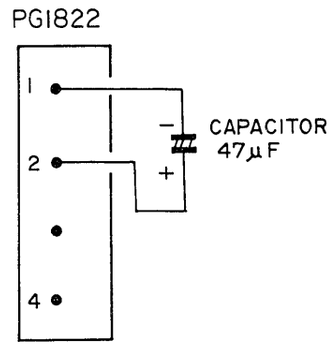


Fig. 4-34 EVF Horizontal Hold Adjustment

EVF Focus Adjustment (Fig. 4-7)

Adjust: RT1803 (FOCUS) Electronic Viewfinder
Observe: EVF Display

This control adjusts for optimum focus of the electronic viewfinder picture.

1. Aim the camera at the resolution chart.
2. Adjust FOCUS control (RT1803) for maximum resolution of the EVF display.

EVF Picture Tilt Adjustment (Fig. 4-35)

Adjust: Deflection Coil Electronic Viewfinder
Observe: EVF Display

This adjustment procedure eliminates picture tilt on the EVF display.

1. Align the camera with chart making sure that both the camera and the chart are on the same plane.
2. Loosen the screw holding the deflection coil.
3. Observe the viewfinder display, and turn the deflection coil until the image is straight.

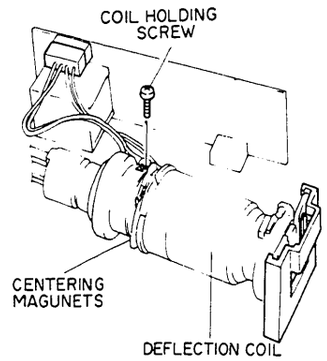


Fig. 4-35 EVF Picture Tilt and EVF Centering Adjustment

EVF Centering Adjustment (Fig. 4-35)

Adjust: Centering Magnets Electronic Viewfinder
Observe: EVF Display

This adjustment centers the image observed by the camera, in the EVF display.

1. Aim the camera at the resolution chart and align the center of the chart with the center of the camera lens.
2. Adjust the centering magnets until the center of the picture viewed by the camera is positioned in the center of the EVF Display.

EVF Vertical Size Adjustment (Fig. 4-7)

Adjust: RT1802 (V. SIZE) Electronic Viewfinder
Observe: EVF Display

This adjustment determines the vertical size of the image appearing in the EVF display.

1. Aim the camera at the resolution chart, and line up the reference arrow head with the edge of the raster in the EVF.
2. Adjust V. SIZE control (RT1802) so that the circle in the chart is round.

EVF Contrast and Brightness Adjustment (Fig. 4-7)

Adjust: RT1804 (CONTRAST) Electronic Viewfinder
RT1805 (BRIGHT) "
Observe: EVF Display
Monitor TV

This adjustment sets the brightness and contrast of the picture in the EVF display.

1. Connect the video out from the camera power supply to the monitor.
2. Aim the camera at the gray scale chart.
3. Adjust BRIGHT control (RT1805) and the CONTRAST control (RT1804) so the black and white portions of the chart displayed in the EVF match those displayed by the monitor screen.

AUTOFOCUS ADJUSTMENT

Autofocus Offset Adjustment (Figs. 4-8, 4-36, 4-37)

Test Points: TL1 Autofocus
TL3 "
Adjust: RV4 (A + B OFFSET) "
RV3 (A – B OFFSET) "
Observe: Oscilloscope

1. Connect TL4 and ground (TL5).
2. Cover the left half of the Autofocus Window (reception portion of the autofocus system) with thick black paper.
3. Place the FOCUS switch in the AUTO position.
4. Connect the channel-1 probe to TL1 and the channel-2 probe to TL3.

5. Trigger the oscilloscope. (Use TL2 on the autofocus board.)
6. Adjust A + B OFFSET control (RV4) so the waveform for channel –1 is minimum.
7. Adjust A – B OFFSET control (RV3) so the waveform for channel –2 is minimum.
8. Disconnect short circuit TL4 and ground (TL5).

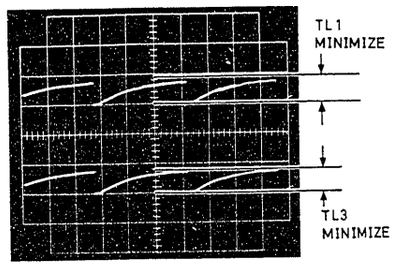


Fig. 4-36 Autofocus Offset Adjustment

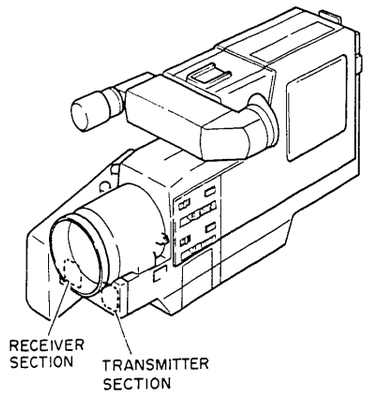


Fig. 4-37 Autofocus Offset Adjustment

Autofocus Gain Adjustment (Figs. 4-8, 4-38)

Test Point:	TL1	Autofocus
Adjust:	RV2 (A GAIN)	"
	RV1 (B GAIN)	"
Observe:	Oscilloscope	

1. Connect TL4 and ground (TL5).
2. Aim the camera at a white object.
3. Place the FOCUS switch in the AUTO position.
4. Move the object 50 cm away from the infrared receiver.
5. Cover the receiver with thin transparent paper (tracing paper).
6. Connect the oscilloscope to TL1.
7. Adjust A GAIN control (RV2) and B GAIN control (RV1) to minimize the trailing edge period of the waveform.
8. Disconnect short circuit TL4 and ground (TL5).

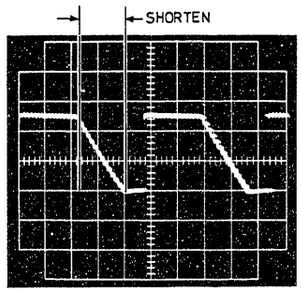


Fig. 4-38 Autofocus Gain Adjustment

Autofocus Offset Confirmation (Figs. 4-8, 4-36, 4-37)

Test Point:	TL3	Autofocus
	TL1	"
Observe:	Oscilloscope	

1. Connect TL4 and ground (TL5).
2. Cover the right half of the Autofocus Window (receiver portion of the autofocus system) with thick black paper.
3. Place the focus switch in the AUTO position.
4. Connect the channel-1 probe to TL1 and the channel-2 probe to TL3.
5. Trigger the oscilloscope. (Use TL4 on the autofocus board.)
6. Confirm that the waveform is 0 Vp-p±50 mV.
7. If the waveform is not within the specified value given in step 4, perform the Autofocus Offset Adjustment.
8. Disconnect short circuit TL4 and ground (TL5).

Autofocus Sensor Position Adjustment (Fig. 4-39)

Adjust: Sensor Adjustment Screw
Observe: Monitor TV

1. Place the FOCUS switch in the AUTO position.
2. Aim the camera at the Autofocus Chart.
3. Place the chart three meters from the camera lens.
4. Adjust the Sensor Adjustment Screw for optimum focus of the monitored picture.

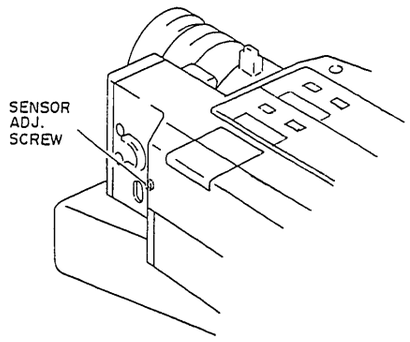


Fig. 4-39 Autofocus Sensor Position Adjustment

COMPONENT BOARDS LOCATION AND IDENTIFICATION (VTR SECTION)

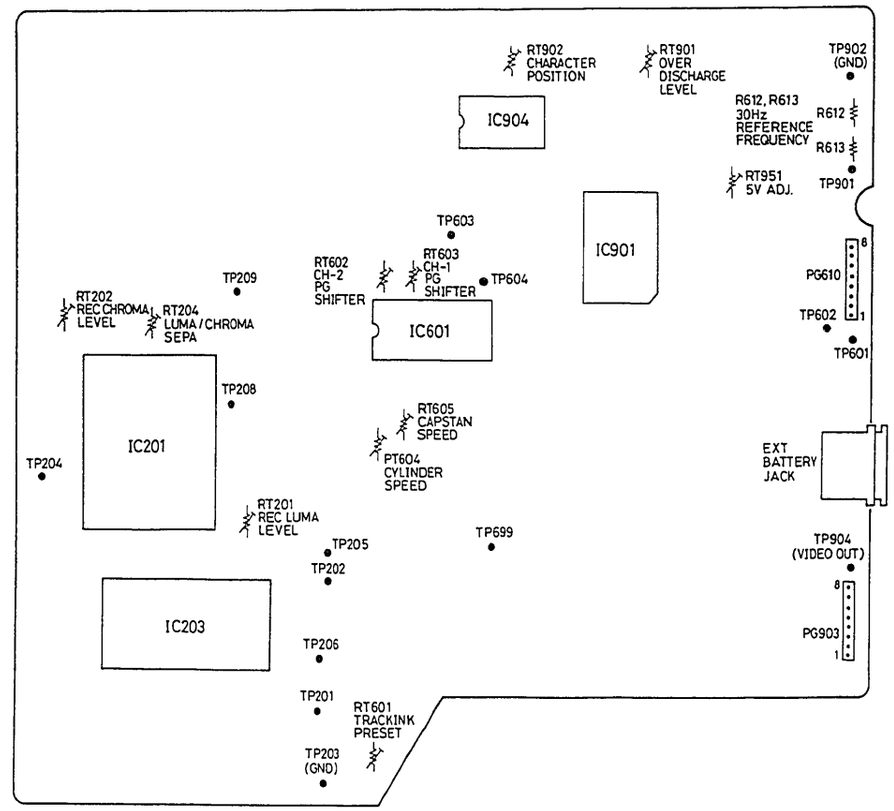


Fig. 4-101 Main Circuit Board (Solder Side)

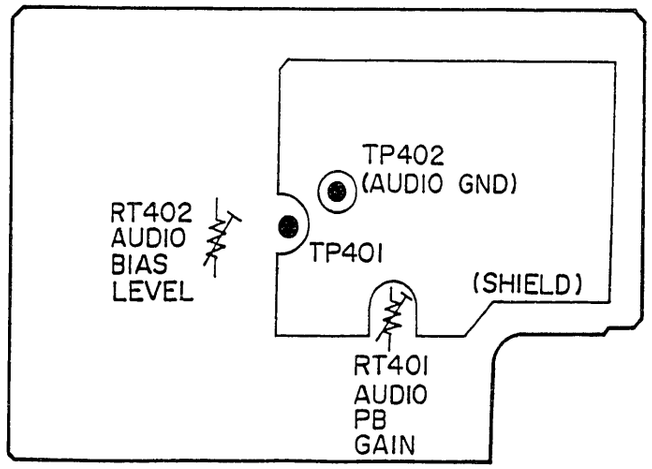


Fig. 4-102 Audio Circuit Board (Solder Side)

VTR SECTION

MAIN CIRCUIT (SWITCHING REGULATOR SECTION)

5V Adjustment (Fig. 4-101)

This adjustment sets the output voltage of the 5V Regulator precisely to 5V as the main power supply for the circuit.

Test Point: TP901 ($\overline{\text{STBY}}$ 5V) Main
Adjust: RT951 (5V Adj.) "

1. Apply the DC12V to the EXT battery jack.
2. Place the instrument in the "Record" mode.
3. Connect the DVM to TP901.
4. Adjust the 5V Adj control (RT951) for 5.3V ± 0.05V DC.

Overdischarge Level Adjustment (Figs. 4-101, 4-103)

This adjustment determines the overdischarge detection level. When the battery voltage drops to a specified level, the VTR will automatically shut off. When the overdischarge detection level is set below 11.5V the battery service life will deteriorate. Conversely, when the voltage is adjusted higher than 11.6V the usable time per charge is shortened.

Observe: Monitor Left side
Adjust: RT901 (OVERDISCHARGE LEVEL) Main

1. Turn the OVERDISCHARGE LEVEL control (RT901) fully counterclockwise.
2. Apply the DC 11.6V ±10 mV to the EXT battery jack terminal.
3. Place the instrument in the "Record" mode.
4. Press the Display button to display the battery level indicator and tape counter on the monitor screen.
5. Turn to adjust OVERDISCHARGE LEVEL control (RT901) so the battery level indicator state (a) is charged to state (b) as in Fig. 4-103.

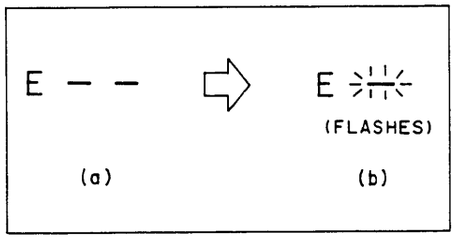


Fig. 4-103 Overdischarge Level Adjustment

Character Position Adjustment (Figs. 4-101, 4-104)

This adjustment regulates the horizontal width of the character display on the screen.

Observe: Monitor
Adjust: RT902 (CHARACTER POSITION) Main

1. Apply NTSC color bar signal to EVF jack.
2. Set the VTR/CAMERA switch to CAMERA position.
3. Press the Display button to display the battery level indicator and tape counter on the monitor screen.
4. Adjust the CHARACTER POSITION control (RT902) so the border between white and (B-Y) s of the color bar signal is placed at the center of the 4nd character from the right on the monitor screen.

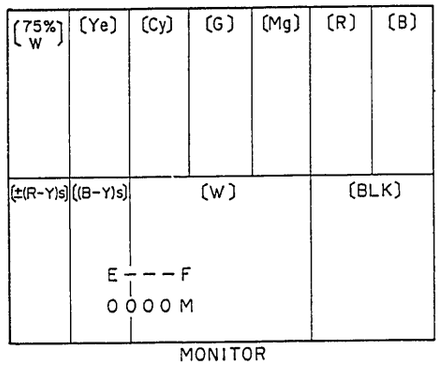


Fig. 4-104 Character Position Adjustment

MAIN CIRCUIT (SERVO SECTION)

Cylinder Motor Speed Adjustment (Figs. 4-101, 4-105, 4-106)

This adjustment locks the cylinder servo to the system signal and maintains a constant cylinder speed of 2700 rpm. When not adjusted properly, horizontal stability is degraded and/or picture noise increases.

Test Point: TP603 (CYLINDER SPEED) Main
Adjust: RT604 (CYLINDER SPEED) "

1. Connect the oscilloscope to TP603. (0.5V/5msec. cm)
2. Load the instrument with a blank tape and place the instrument in the "Record" mode.
3. Connect the jumper between PG610-4 and TP901 to release the cylinder phase control.
4. Adjust the CYLINDER MOTOR SPEED control (RT-604) so that the sampling pulse stands still or moves slowly on the PG pulse. (See Fig. 4-105)
5. Remove the jumper between PG610-4 and TP901 and confirm the sampling pulse is locked in on the trailing edge of the PG pulse. (See Fig. 4-106)

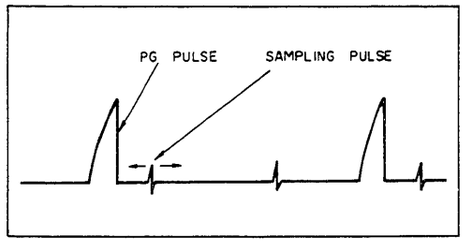


Fig. 4-105 Cylinder Motor Speed Adjustment (During short-circuiting)

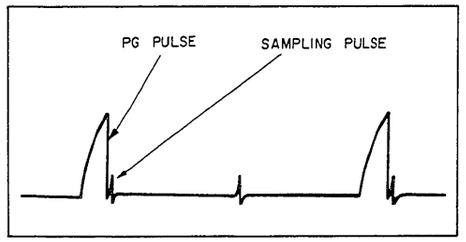


Fig. 4-106 Cylinder Motor Speed Adjustment (with short-circuiting disconnected)

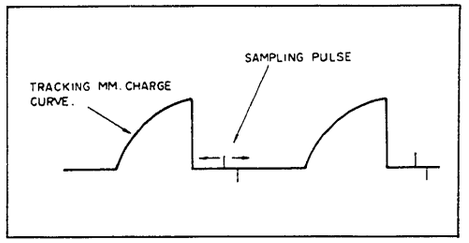


Fig. 4-107 Capstan Motor Speed Adjustment (During short-circuiting)

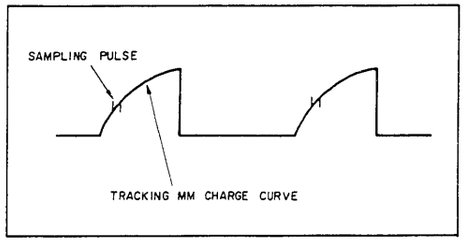


Fig. 4-108 Capstan Motor Speed Adjustment (with short-circuiting disconnected)

Capstan Motor Speed Adjustment (Figs. 4-101, 4-107, 4-108)

This adjustment locks the capstan servo to the system signals and maintains a constant tape transport speed.
When not adjusted properly, the vertical stability is degraded and/or the picture noise increases.

Test Point: TP604 (CAPSTAN SPEED) Main
Adjust: RT605 (CAPSTAN SPEED) "

1. Apply a NTSC color bar signal to EVF jack.
2. Connect the oscilloscope to TP604. (0.5V/5msec. cm)
3. Load the instrument with a blank tape and place the instrument in the "Record" mode.
4. Connect a jumper between PG610-4 and TP901 to release the capstan phase control.
5. Adjust the CAPSTAN SPEED control (RT605) so that the sampling pulse stands still or moves slowly on the PG pulse. (See Fig. 4-107)
6. Remove the jumper between PG610-4 and TP901 and confirm the sampling pulse is locked in on the trailing edge of the PG pulse. (See Fig. 4-108)

30 Hz Reference Frequency Adjustment (Fig. 4-101)

This reference frequency is used to correct for fluctuations caused by unevenness between the belt, pulley, capstan motor and capstan shaft.

Test Point: AUDIO OUTPUT (PG903-6) Main

1. Connect the frequency counter to AUDIO OUTPUT (PG903-6).
2. Connect a jumper between TP601 and TP901 on the main circuit board.
3. Load the instrument with an alignment tape and play back the 3 kHz audio signal.
4. Confirm that the frequency reading on the counter is 3000 Hz ±15 Hz.
5. If the reading is higher than 3015 Hz, remove R613. Check for the presence of R612. If not present, add R612.
6. If the reading is lower than 2985 Hz, remove R612. Check for the presence of R613. If not present, add R613.
7. Remove the jumper.

Head Switching Point Adjustment (Figs. 4-101, 4-109)

The pulse generator (PG) shifter determines the video head switching point during playback.
Misadjustment of PG Shifter may cause head switching noise in the picture and/or vertical instability.

Test Point:	VIDEO OUT (TP904)	Main
Adjust:	RT603 (CH-1 PG SHIFTER)	"
	RT602 (CH-2 PG SHIFTER)	"

1. Load the instrument with an alignment tape and play back the color bar signal.
2. Connect the oscilloscope to TP904 (2V/50 μsec. cm). (See Fig. 4-101)
3. Trigger the oscilloscope at SW 30 Hz (Use TP202 on the main circuit board.)
4. Set the oscilloscope to (–) slope and adjust the CH-1 PG SHIFTER (RT603) so that the leading edge of the SW 30 Hz signal is placed 6.5H ± 0.5H (horizontal) lines before the start of vertical sync.
5. Set the oscilloscope to (+) slope and adjust the CH-2 PG SHIFTER (RT602) so that the leading edge of the SW 30 Hz signal is placed 6.5H ± 0.5H (horizontal) lines before the start of vertical sync.

Note: The waveform of CH-1 and CH-2 video signals in the diagram may be opposite depending on the alignment tape.

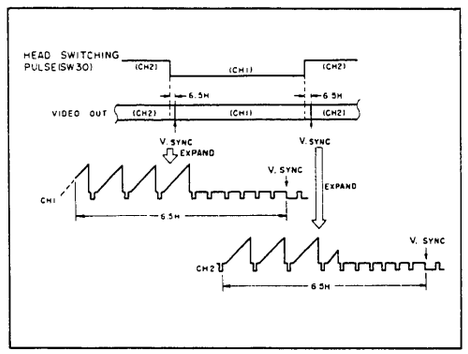


Fig. 4-109 Head Switching Point

Tracking Preset Adjustment (Figs. 4-101, 4-110)

This adjustment is performed to obtain correct tracking during playback of a tape recorded on the same instrument. When this adjustment is incomplete, noise may conspicuous with the tracking control placed in the detent position or noise may not be removed by the tracking control.

Test Points:	VIDEO OUT (TP904)	Main
	TP604 (CAPSTAN SPEED)	"
Adjust:	RT601 (TRACKING PRESET)	"

1. Set the TRACKING control located on the left side to the mechanical center (center click) position.
2. Apply a NTSC color bar signal to the EVF jack.
3. Using a blank tape, make a recording and play back.
4. Connect the channel-1 of oscilloscope to TP604 (1V/0.5 msec. cm). (See Fig. 4-101)
5. Connect the channel-2 of oscilloscope to TP904 (0.5V/0.5msec. cm). (See Fig. 4-101)
6. Trigger the oscilloscope at SW 30 Hz. (Use TP202 on the main circuit board.)
7. Set the oscilloscope to (–) slope.
8. Adjust the TRACKING PRESET control (RT601) so that the CTL pulse and the vertical sync back porch of the video signal match.

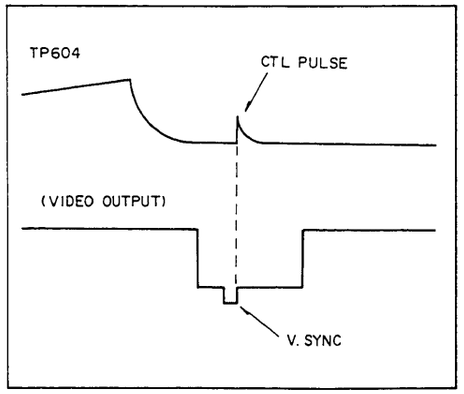


Fig. 4-110 Tracking Preset

MAIN CIRCUIT (LUMA/CHROMA SECTION)

Luminance/Chroma Separation Adjustment (Fig. 4-101, 4-111)

This adjustment cancels the chroma signal components and extracts only the luminance signal. If this adjustment is incomplete, the S/N deteriorates.

Test Point:	TP208 (REC CURRENT)	Main
Adjust:	RT204 (LUMA/CHROMA SEPA)	"

1. Apply a NTSC color bar signal to EVF jack.
2. Connect the oscilloscope to TP208. (0.2V/20 μ sec. cm)
3. Place the instrument in the "Stop" mode.
4. Adjust the LUMA/CHROMA SERA control (RT204) to minimize the chroma component in the video signal. (see Fig. 4-111)

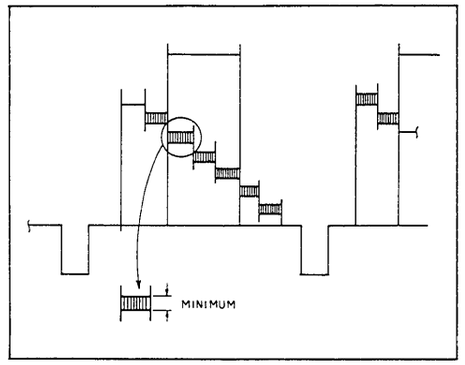


Fig. 4-111 Luma/Chroma Separation Adjustment

Record Chroma Level Adjustment (Figs. 4-101, 4-112, 4-113, 4-114)

Optimum record color level is regulated by this adjustment. If the record chroma level is too high, diamond beats can be seen in the screen. If the level is too low, the color is degraded.

Test Point:	TP201 (REC CURRENT)	Main
Adjust:	RT202 (REC CHROMA LEVEL)	"

1. Apply a NTSC color bar signal to EVF jack.
2. Adjust the input color bar signal level for 1Vp-p measured at the video input jack.
3. Connect the oscilloscope to TP201. (10 mV/20μsec.cm) (Used GND TP206)
4. Trigger the oscilloscope at 15 Hz. (Use TP205 on Main circuit board.)
5. Load the instrument with a blank tape and place in the record mode.
6. Turn the REC LUMA LEVEL control (RT201) fully counterclockwise. (As seen from solder side.)
7. Check the upper cylinder to see number stamped on the top. (See Fig. 4-112)
8. Adjust REC CHROMA LEVEL control (RT202) as shown in the chart. (See Figs. 4-113, 4-114)
9. Perform the record luma level adjustment.

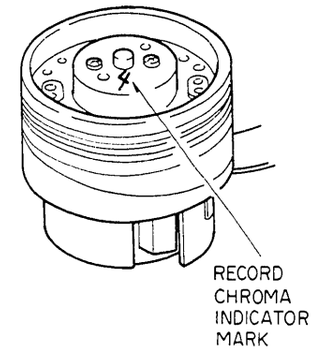


Fig. 4-112 Upper Cylinder Mark Location

MARK	LEVEL
0	35mVp-p
2	40mVp-p
4	45mVp-p

Fig. 4-113 Record Chroma Level

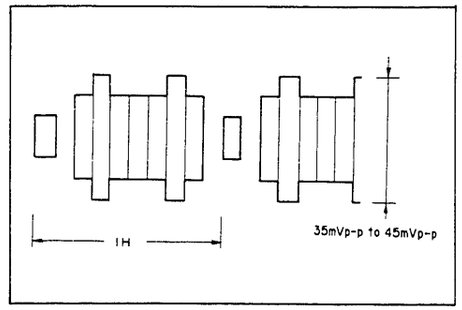


Fig. 4-114 Record Chroma Level

Record Luminance Level Adjustment (Figs. 4-101, 4-115)

Optimum record luma level is regulated by this adjustment. If the record luma level is too high, video may be overloaded. If the level is too low, the S/N ratio deteriorates. Record chroma level should be set prior to adjusting the record luma level.

Test Point:	TP201 (REC CURRENT)	Main
Adjust:	RT201 (REC LUMA LEVEL)	"

1. Apply a NTSC color bar signal to EVF jack.
2. Adjust the input color bar signal level for 1Vp-p measured at the video input jack.
3. Connect the oscilloscope to TP201. (50mV/20μ sec. cm) (Used GND TP206)
4. Load the instrument with a blank tape and place in the record mode.
5. Adjust REC LUMA LEVEL control (RT201) for 150 mVp-p ± 10 mVp-p.

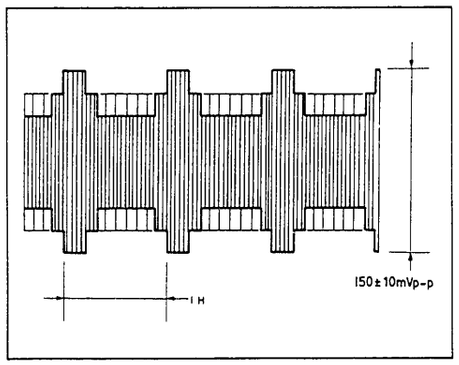


Fig. 4-115 Record Luminance Level

AUDIO CIRCUIT

Audio Playback Gain Adjustment (Figs. 4-101, 4-102)

This adjustment sets the output level of the audio signal to the specified level.

Test Points:	PG903-6 (AUDIO OUTPUT)	Main
	PG903-4 (AUDIO GND)	"
Adjust:	RT401 (AUDIO PB GAIN)	Audio

1. Connect the millivoltmeter to PG903-6. (Used GND PG903-4)
2. Load the instrument with an alignment tape and play back the 1 kHz audio signal.
3. Adjust the AUDIO PB GAIN control (RT401) for 316 ±18 mVrms.

Audio Bias Level Adjustment (Fig. 4-102)

This adjustment optimizes the audio record bias. When the audio record bias is too low, high frequencies are increased resulting in distortion. When the level is too high, high frequencies are attenuated.

Test Points:	TP401 (REC BIAS)	Audio
	TP402 (BIAS GND)	"
Adjust:	RT402 (AUDIO BIAS LEVEL)	"

1. Connect the millivoltmeter to TP401. (Used GND TP402)
2. Load the instrument with a blank tape and place in the record mode.
3. Adjust AUDIO BIAS LEVEL control (RT402) for 2.2 mV±0.1mVrms.

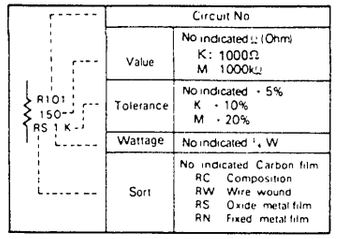
SCHEMATIC DIAGRAMS AND CIRCUIT BOARD DIAGRAMS

WHEN USING THIS SERVICE REFERENCE MATERIAL

1. How to read abbreviations

Note

1 Voltage measured at base of chassis with minimum volume control and no signal
2 Nomenclature of Resistors and Capacitors



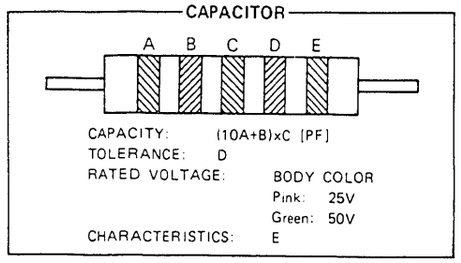
Circuit No		
Value		No indicated Ω (Ohm) K: 1000Ω M 1000kΩ
Tolerance		No indicated ・5% K ・10% M ・20%
Wattage		No indicated ¼ W
Sort		No indicated Carbon film RC Composition RW Wire wound RS Oxide metal film RN Fixed metal film
Circuit No		
Value		No indicated μF P PF
Tolerance		No indicated ・10% J ・5% M ・20% Z ・80%, 20% D ・0.5pF C ・0.25pF
Sort		Ceramic
		Electrolitic
	M	Mylar
	P	Polyester
	S	Styrol
Voltage		No indicated 50WV

3 Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort

2. Cautions on use of MOS IC

1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during doldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibres or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a workers should be grounded.
4. Be sure to ground measuring instruments such as oscilloscopes, VTVMs, etc. used for repairs.

3. How to read capacity and inductance of resistor shape capacitors and coils



COLOR	A, B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Grey	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	± 5%	
Silver		10^{-2}	±10%	High dielectric constant type

LEADLESS COMPONENT IDENTIFICATION

1. Leadless Transistor

The leadless transistor number is indicated by a code on the surface, using two alphabet letters, one numeral and two alphabet letters or one alphabet letter and one numeral.

(1) Identification for one alphabet letter and one numeral, two alphabet letters or one numeral and two alphabet letters.
Use this code and the following chart for component identification.

Letter	Transistor No.	Letter	Transistor No.
A	2SB709	P	2SD814
B	2SC1621	Q	2SC2620
BR	2SC2412KR(BR)	R	2SC2618
BS	2SC2412KS(BS)	S	2SA1121
C	2SC1122	U	2SC2404
CR	2SB710R(CR)	WQ	2SK322Q(WQ)
CQ	2SC2412KQ(CQ)	W	2SD602
D	2SC2463	X	2SK157
E	2SA1022	Y	2SD601
F	2SC2619	1F	2SK321
FR	2SA1037KR(FR)	1M	2SA1052
H	2SC1036K	1K	2SK316
I	2SB792	2B	2SK374
K	2SK160	13	DTA143K
L	2SC2462	15	DTA124K
L(6)	2SC1623(6)(L6)	25	DTC124K
M	2SA1052	26	DTC144K
N	2SC1653		

Example:

Code	Number
CD	2SA1122D
LD	2SC2462D

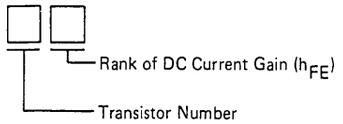


Fig. 1 Leadless Transistor Code

(2) Identification for one alphabet letter and one numeral.
Use this code and the following chart for component identification.

Letter	Transistor Number
L	2SC1623

Example:

Code	Number
L5	2SC1623 (5)
L6	2SC1623 (6)

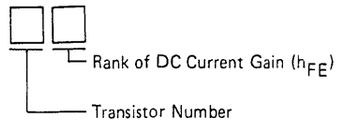


Fig. 2 Leadless Transistor Code

2. Leadless Diode

The leadless diode number is indicated by a code on the surface, using two alphabet letters or numerals and alphabet.
Use this code and the following chart for component identification.

Code	Diode No.	Code	Diode No.
MH	MA151K	6.8	MA3068
MT	MA151WK	6.8M	MA3068M
MU	MA152WK	9.1	MA3091
MN	MA151WA	27	RD2.7M-B
MO	MA152WA	30	RD3.0M-B
MC	MA153	56	RD5.6M-B
NT	DAN202K	91	RD9.1M-B

3. Leadless Resistors

The resistor value is indicated on the surface of the component, using a three digit number or one alphabet letter and one numeral.

(1) Identification for three digit numbers
Read this code following the same procedure as when reading the color code on discrete resistors.

Example:

Code	Value
330	$33 \times 10^0 = 33$ ohms
561	$56 \times 10^1 = 560$ ohms
123	$12 \times 10^3 = 12$K ohms
1R2	1 + 0.2 = 1.2 ohms
	(R: Decimal point)

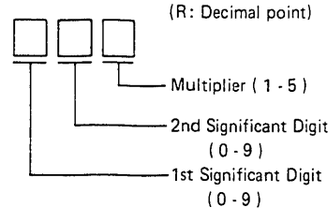


Fig. 3 Leadless Resistor Code

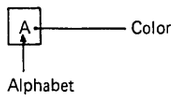
(2) Identification for one alphabet letter and one numeral. Use this code and the following chart for component identification.

Letter	Value	Letter	Value	Letter	Value
A	1	J	2.2	S	4.7
C	1.2	L	2.7	U	5.6
E	1.5	N	3.3	W	6.8
G	1.8	Q	3.9	Y	8.2

4. Leadless Capacitors

The capacitive value is indicated on the surface of the component, using body color and one alphabet, or one alphabet and one numeral.

(1) Identification for body color and one alphabet.



Body Color	Alphabet	Value
Red	A	1 (PF)
	C	2
	E	3
	G	4
	J	5
	L	6
	N	7
	Q	8
	S	9
Black	A	10 (PF)
	C	12
	E	15
	G	18
	J	22
	L	27
	N	33
	Q	39
	S	47
	U	56
	W	68
	Y	82

Example:

Color	Code	Value
Red	A	1 PF
Black	A	10PF

Example:

Code	Value
A1	1×10^1 = 10 ohms
G2	1.8×10^2 = 180 ohms
L3	2.7×10^3 = 2700 ohms
S4	4.7×10^4 = 47K ohms
W5	6.8×10^5 = 680K ohms

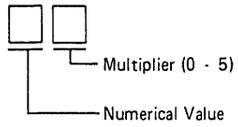
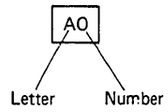


Fig. 4 Leadless Resistor Code

Compo-nent Color	Alphabet	Value
Blue	A	100 (PF)
	C	120
	E	150
	G	180
	J	220
	L	270
	N	330
	Q	390
	S	470
	U	560
	W	680
	Y	820
White	A	0.001 (μF)
	E	0.0015
	J	0.0022
	L	0.0027
	N	0.0033
	S	0.0047
	W	0.0068
Green	A	0.01 (μF)
	E	0.0015
	J	0.022
	N	0.033
	S	0.047
	U	0.056
	W	0.068
Yellow	A	0.01 (μF)

(2) Identification for one alphabet and one numeral



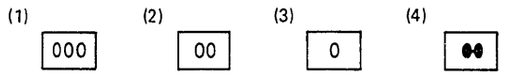
Letter/Number	Value	Letter/Number	Value
A0	1 (PF)	A2	100 (PF)
H0	2	C2	120
M0	3	E2	150
d0	4	G2	180
f0	5	J2	220
m0	6	L2	270
n0	7	N2	330
t0	8	Q2	390
y0	9	S2	470
		U2	560
A1	10 (PF)	W2	680
C1	12	Y2	820
E1	15		
G1	18	A3	0.001 (μF)
J1	22	E3	0.0015
L1	27	J3	0.0022
N1	33	N3	0.0033
Q1	39	S3	0.0047
S1	47	W3	0.0068
U1	56		
W1	68	A4	0.01 (μF)
Y1	82	E4	0.015
		J4	0.022
		N4	0.033
		S4	0.047
		U4	0.056
		W4	0.068
		A5	0.1

Example:

Letter/Number	Value
A0	1PF
A1	10PF

5. Leadless Jumper

The leadless jumper is indicated as shown below.



SCHEMATIC DIAGRAMS AND CIRCUIT BOARD DIAGRAMS CONTENTS

CIRCUIT BOARD CONNECTION DIAGRAM
- ELECTRONIC VIEWFINDER 74
- AUTO FOCUS 74
- CAMERA 75
- VTR 77

SENSOR
- SCHEMATIC DIAGRAM 79
- CIRCUIT BOARD DIAGRAM 85
- WAVEFORMS 81

PROCESS
- SCHEMATIC DIAGRAM
  - CHROMA FILTER 87
  - PROCESS 89
- CIRCUIT BOARD DIAGRAM 97
- WAVEFORMS 91

ENCODER
- SCHEMATIC DIAGRAM 100
- CIRCUIT BOARD DIAGRAM 107
- WAVEFORMS 103

WIRING · CONTROL · REGULATOR
- SCHEMATIC DIAGRAM
  - WIRING 110
  - REGULATOR 111
  - CONTROL 111
- CIRCUIT BOARD DIAGRAM
  - WIRING 113
  - REGULATOR 115
  - CONTROL 112

MIC JACK
- SCHEMATIC DIAGRAM 116
- CIRCUIT BOARD DIAGRAM 116

ELECTRONIC VIEWFINDER
- SCHEMATIC DIAGRAM 117
- CIRCUIT BOARD DIAGRAM
  - ELECTRONIC VIEWFINDER 119
- WAVEFORMS 121

AUTO FOCUS
- SCHEMATIC DIAGRAM
  - AUTO FOCUS 123
- CIRCUIT BOARD DIAGRAM
  - AUTO FOCUS 125

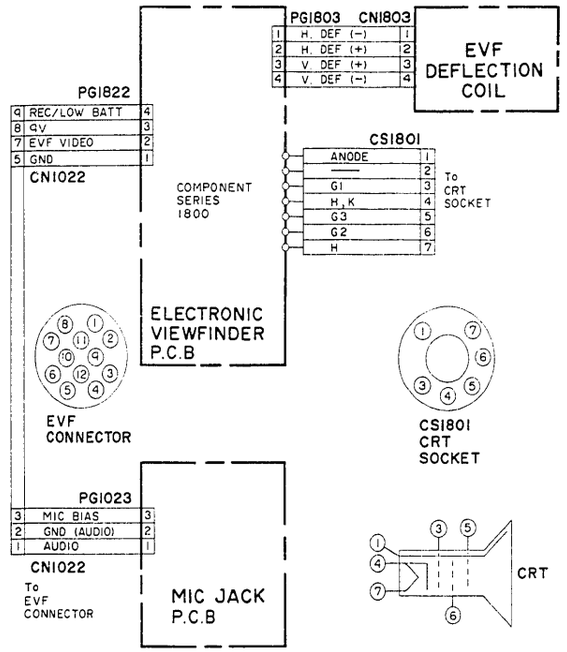
MAIN
- SCHEMATIC DIAGRAM
  - SYSTEM CONTROL 126
  - SWITCHING REGULATOR 129
  - CYL.–/CAPST.–MOTORS DRIVE 130
  - SERVO 131
  - HEAD SW/LUMA 139
  - CHROMA 141
- CIRCUIT BOARD DIAGRAM 153
- WAVEFORMS
  - SERVO 133
  - LUMA/CHROMA 143

FUNCTION SW
- SCHEMATIC DIAGRAM 156
- CIRCUIT BOARD DIAGRAM 157

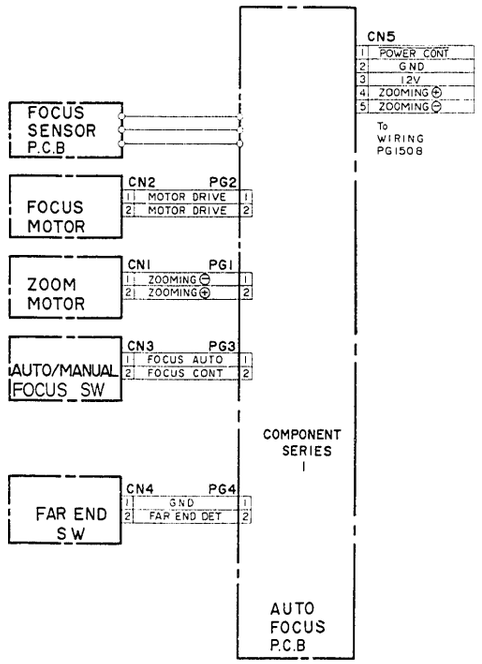
AUDIO
- SCHEMATIC DIAGRAM
  - AUDIO 159
  - TROUBLE SENSOR 162
- CIRCUIT BOARD DIAGRAM
  - AUDIO 160
  - END LAMP 163
  - TAKE-UP END SENSOR 163
  - SUPPLY END SENSOR 163
  - SAFETY TAB SW 163
  - CASSETTE HOLDER SW 163
  - TAKE-UP REEL SENSOR 164
  - SUPPLY REEL SENSOR 164

SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL.–/CAPST.–MOTORS DRIVE	130
HEAD SW/LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

• ELECTRONIC VIEWFINDER

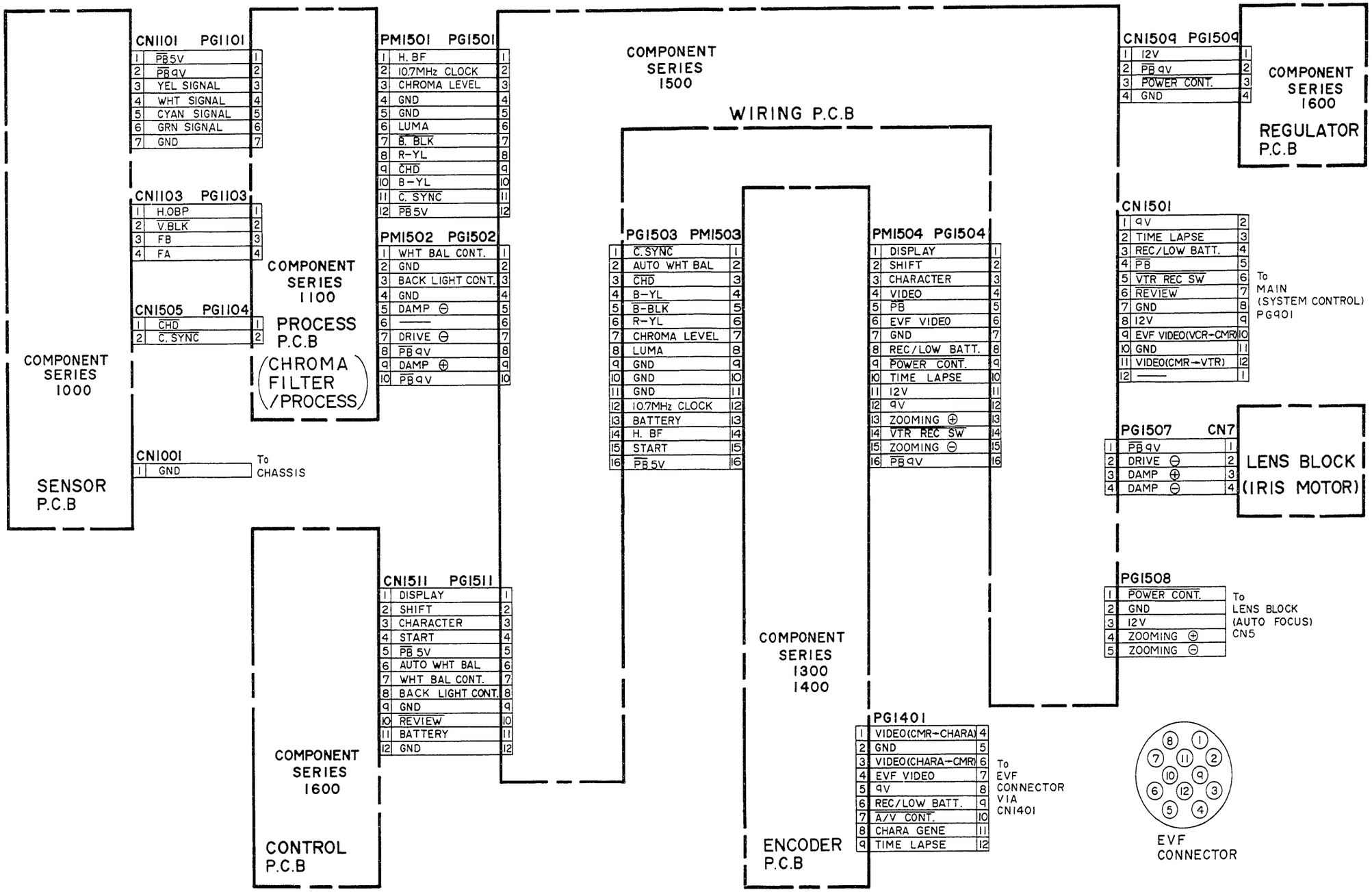


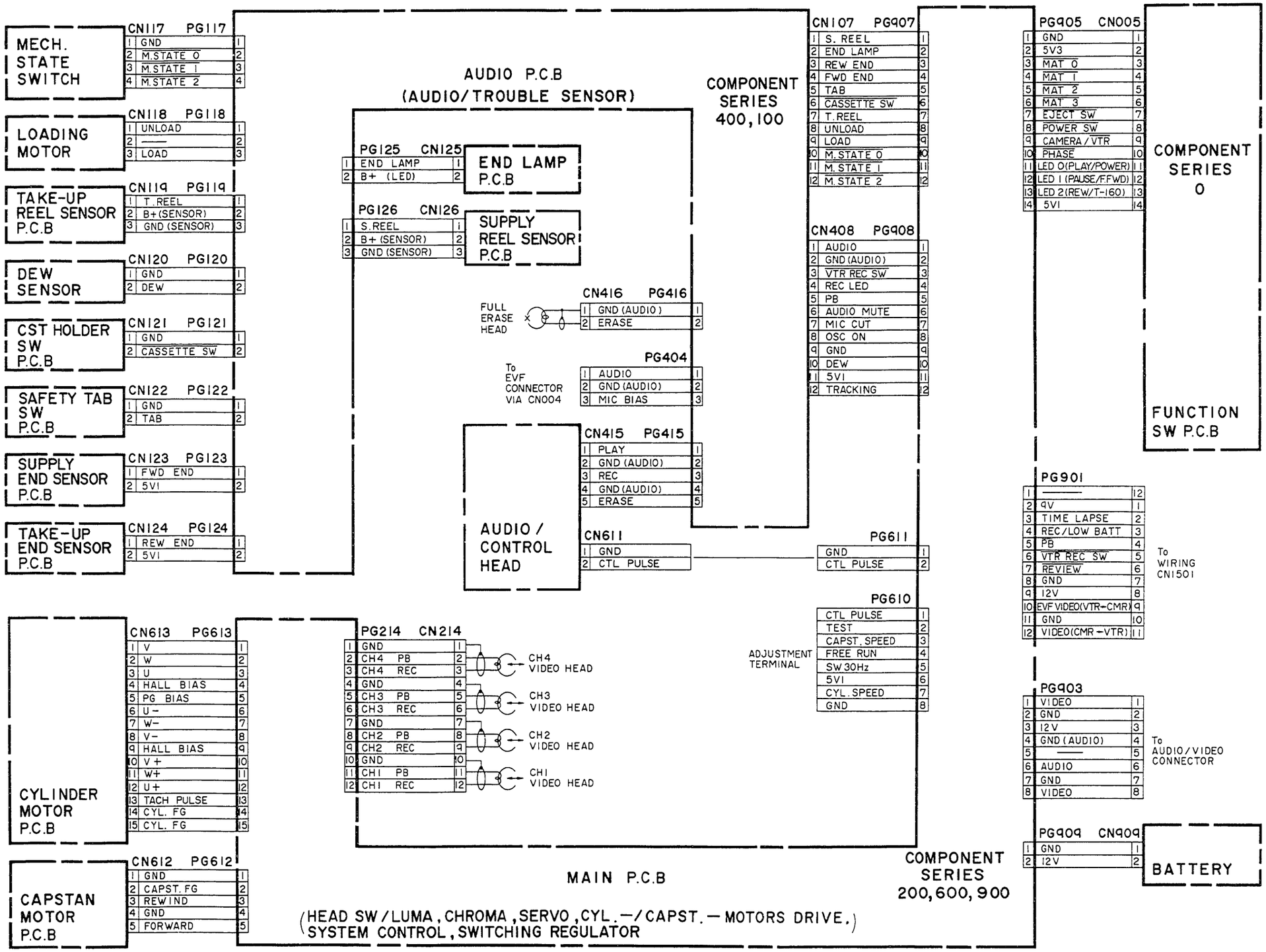
• AUTO FOCUS



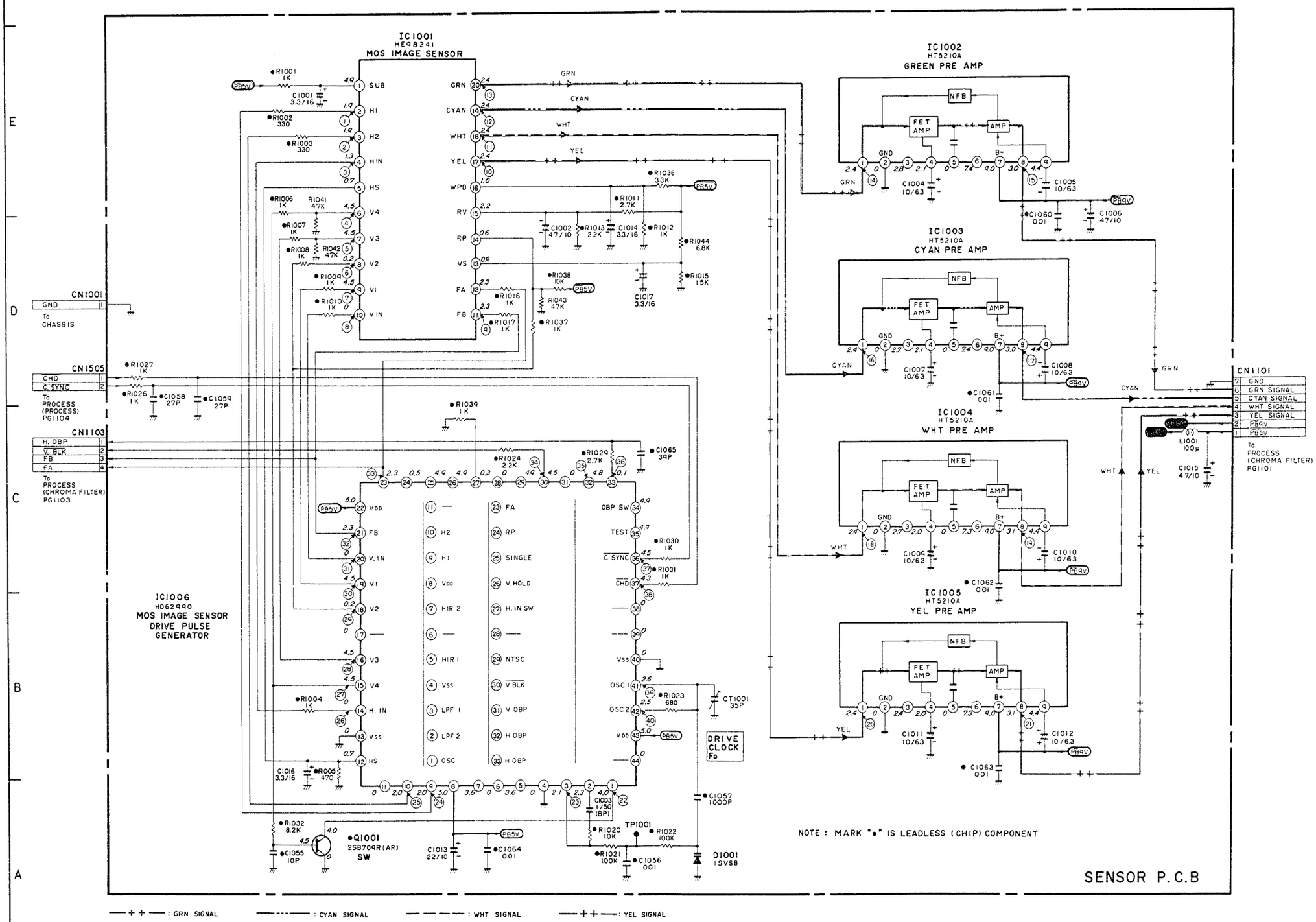
CIRCUIT BOARD CONNECTION DIAGRAM

• CAMERA




MECH. STATE SWITCH
CN117 PG117
1 GND 1
2 M.STATE 0 2
3 M.STATE 1 3
4 M.STATE 2 4
LOADING MOTOR
CN118 PG118
1 UNLOAD 1
2 —— 2
3 LOAD 3
TAKE-UP REEL SENSOR P.C.B
CN119 PG119
1 T.REEL 1
2 B+(SENSOR) 2
3 GND (SENSOR) 3
DEW SENSOR
CN120 PG120
1 GND 1
2 DEW 2
CST HOLDER SW P.C.B
CN121 PG121
1 GND 1
2 CASSETTE SW 2
SAFETY TAB SW P.C.B
CN122 PG122
1 GND 1
2 TAB 2
SUPPLY END SENSOR P.C.B
CN123 PG123
1 FWD END 1
2 5V1 2
TAKE-UP END SENSOR P.C.B
CN124 PG124
1 REW END 1
2 5V1 2
AUDIO P.C.B
(AUDIO/TROUBLE SENSOR)
PG125 CN125
1 END LAMP 1
2 B+ (LED) 2
END LAMP P.C.B
PG126 CN126
1 S.REEL 1
2 B+ (SENSOR) 2
3 GND (SENSOR) 3
SUPPLY REEL SENSOR P.C.B
FULL ERASE HEAD
CN416 PG416
1 GND (AUDIO) 1
2 ERASE 2
To EVF CONNECTOR VIA CN004
PG404
1 AUDIO 1
2 GND (AUDIO) 2
3 MIC BIAS 3
AUDIO / CONTROL HEAD
CN415 PG415
1 PLAY 1
2 GND (AUDIO) 2
3 REC 3
4 GND (AUDIO) 4
5 ERASE 5
CN611
1 GND 1
2 CTL PULSE 2
PG611
GND 1
CTL PULSE 2
PG610
CTL PULSE 1
TEST 2
CAPST. SPEED 3
FREE RUN 4
SW 30Hz 5
5V1 6
CYL. SPEED 7
GND 8
ADJUSTMENT TERMINAL
CYLINDER MOTOR P.C.B
CN613 PG613
1 V 1
2 W 2
3 U 3
4 HALL BIAS 4
5 PG BIAS 5
6 U− 6
7 W− 7
8 V− 8
9 HALL BIAS 9
10 V+ 10
11 W+ 11
12 U+ 12
13 TACH PULSE 13
14 CYL. FG 14
15 CYL. FG 15
PG214 CN214
1 GND 1
2 CH4 PB 2
3 CH4 REC 3
4 GND 4
5 CH3 PB 5
6 CH3 REC 6
7 GND 7
8 CH2 PB 8
9 CH2 REC 9
10 GND 10
11 CH1 PB 11
12 CH1 REC 12
CH4 VIDEO HEAD
CH3 VIDEO HEAD
CH2 VIDEO HEAD
CH1 VIDEO HEAD
CAPSTAN MOTOR P.C.B
CN612 PG612
1 GND 1
2 CAPST. FG 2
3 REWIND 3
4 GND 4
5 FORWARD 5
MAIN P.C.B
(HEAD SW/LUMA, CHROMA, SERVO, CYL.−/CAPST.− MOTORS DRIVE.)
SYSTEM CONTROL, SWITCHING REGULATOR
COMPONENT SERIES 400,100
CN107 PG907
1 S. REEL 1
2 END LAMP 2
3 REW END 3
4 FWD END 4
5 TAB 5
6 CASSETTE SW 6
7 T.REEL 7
8 UNLOAD 8
9 LOAD 9
10 M.STATE 0 10
11 M.STATE 1 11
12 M.STATE 2 12
CN408 PG908
1 AUDIO 1
2 GND (AUDIO) 2
3 VTR REC SW 3
4 REC LED 4
5 PB 5
6 AUDIO MUTE 6
7 MIC CUT 7
8 OSC ON 8
9 GND 9
10 DEW 10
11 5V1 11
12 TRACKING 12
COMPONENT SERIES 200,600,900
PG905 CN005
1 GND 1
2 5V3 2
3 MAT 0 3
4 MAT 1 4
5 MAT 2 5
6 MAT 3 6
7 EJECT SW 7
8 POWER SW 8
9 CAMERA/VTR 9
10 PHASE 10
11 LED 0(PLAY/POWER) 11
12 LED 1 (PAUSE/F.FWD) 12
13 LED 2(REW/T-160) 13
14 5V1 14
COMPONENT SERIES 0
FUNCTION SW P.C.B
PG901
1 —— 12
2 9V 1
3 TIME LAPSE 2
4 REC/LOW BATT 3
5 PB 4
6 VTR REC SW 5
7 REVIEW 6
8 GND 7
9 12V 8
10 EVF VIDEO(VTR-CMR) 9
11 GND 10
12 VIDEO(CMR-VTR) 11
To WIRING CN1501
PG903
1 VIDEO 1
2 GND 2
3 12V 3
4 GND (AUDIO) 4
5 —— 5
6 AUDIO 6
7 GND 7
8 VIDEO 8
To AUDIO/VIDEO CONNECTOR
PG909 CN909
1 GND 1
2 12V 2
BATTERY

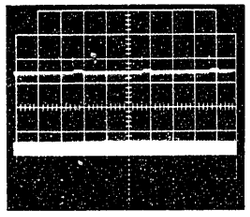
SENSOR SCHEMATIC DIAGRAM



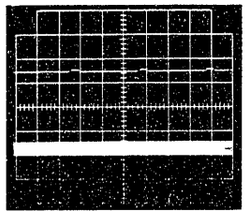
NOTE : MARK "●" IS LEADLESS (CHIP) COMPONENT

SENSOR WAVEFORMS

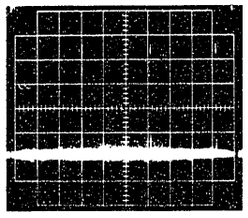
1. IC1001-2
1V/20 μsec. cm



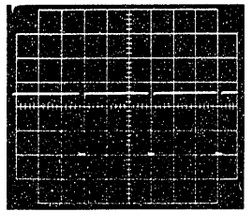
2. IC1001-3
1V/20 μsec. cm



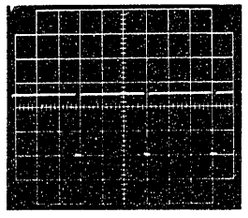
3. IC1001-4
1V/20 μsec. cm



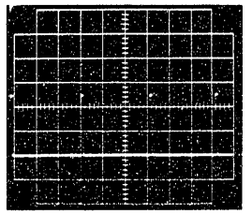
4. IC1001-6
2V/20 μsec. cm



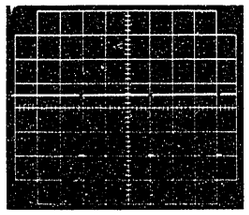
5. IC1001-7
2V/20 μsec. cm



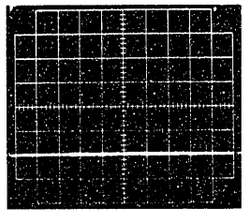
6. IC1001-8
2V/20 μsec. cm



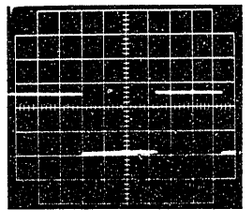
7. IC1001-9
2V/20 μsec. cm



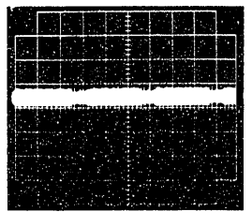
8. IC1001-10
2V/5msec. cm



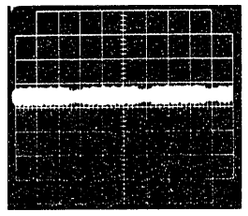
9. IC1001-11
2V/5msec. cm



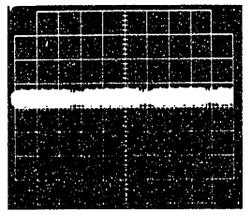
10. IC1001-17
50mV/20 μsec. cm



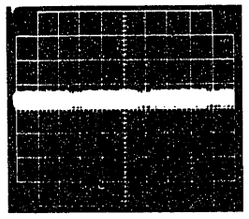
11. IC1001-18
50mV/20 μsec. cm



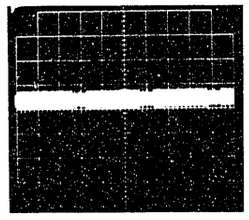
12. IV1001-19
50mV/20 μsec. cm



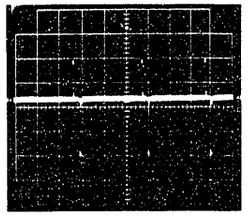
13. IC1001-20
50mV/20 μsec. cm



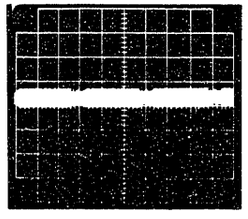
14. IC1002-1
50mV/20 μsec. cm



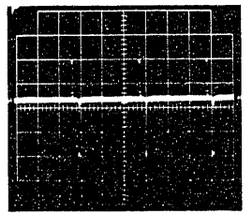
15. IC1002-8
1V/20 μsec. cm



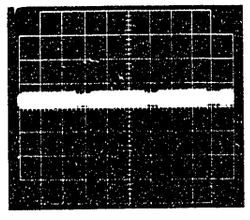
16. IC1003-1
50mV/20 μsec. cm



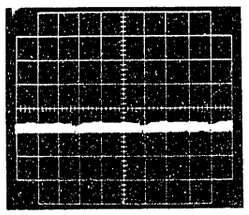
17. IC1003-8
1V/20 μsec. cm



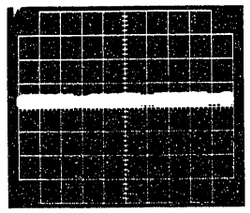
18. IC1004-1
50mV/20 μsec. cm



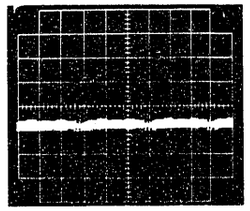
19. IC1004-8



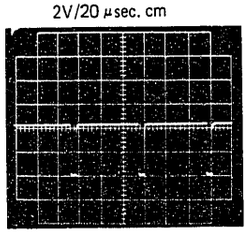
20. IC1005-1



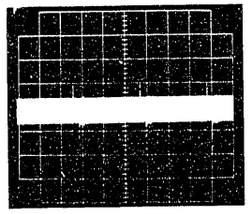
21. IV1005-8



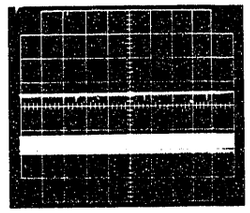
22. IC1006-1
2V/20 μsec. cm



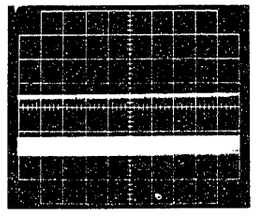
23. IC1006-3
0.1V/20 μsec. cm



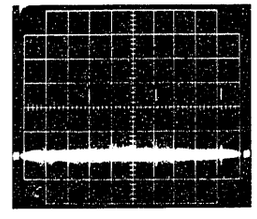
24. IC1006-9
2V/20 μsec. cm



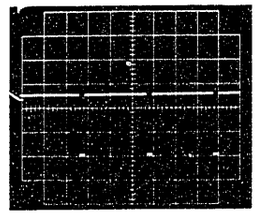
25. IC1006-10
2V/20 μsec. cm



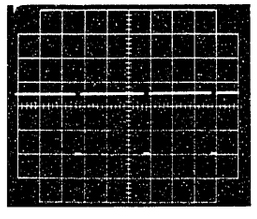
26. IC1006-14
2V/20 μsec. cm



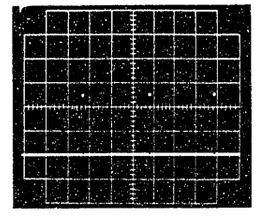
27. IC1006-15
2V/20 μsec. cm



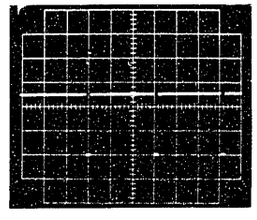
28. IC1006-16
2V/20 μsec. cm



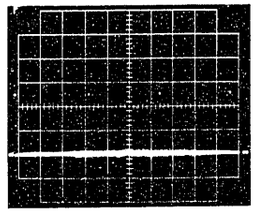
29. IC1006-18
2V/20 μsec. cm



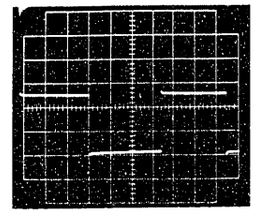
30. IC1006-19
2V/20 μsec. cm



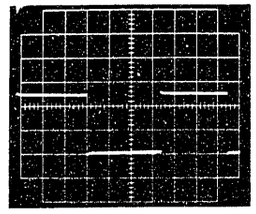
31. IC1006-20
2V/5msec. cm



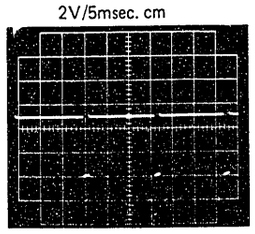
32. IC1006-21
2V/5msec. cm



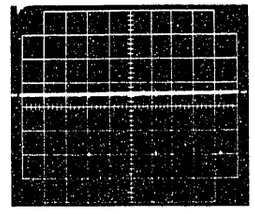
33. IC1006-23
2V/5msec. cm



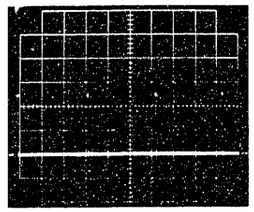
34. IC1006-30
2V/5msec. cm



35. IC1006-32
2V/20 μsec. cm

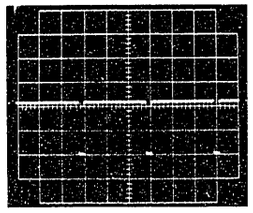


36. IC1006-33
2V/20 μsec. cm

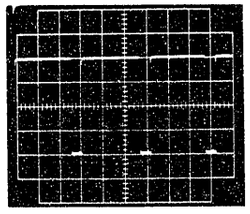


SENSOR WAVEFORMS

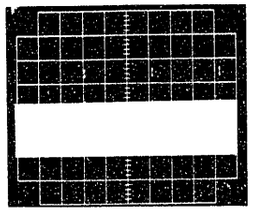
37. IC1006-36
2V/20 μsec. cm



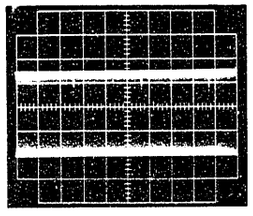
38. IC1006-37
1V/20 μsec. cm



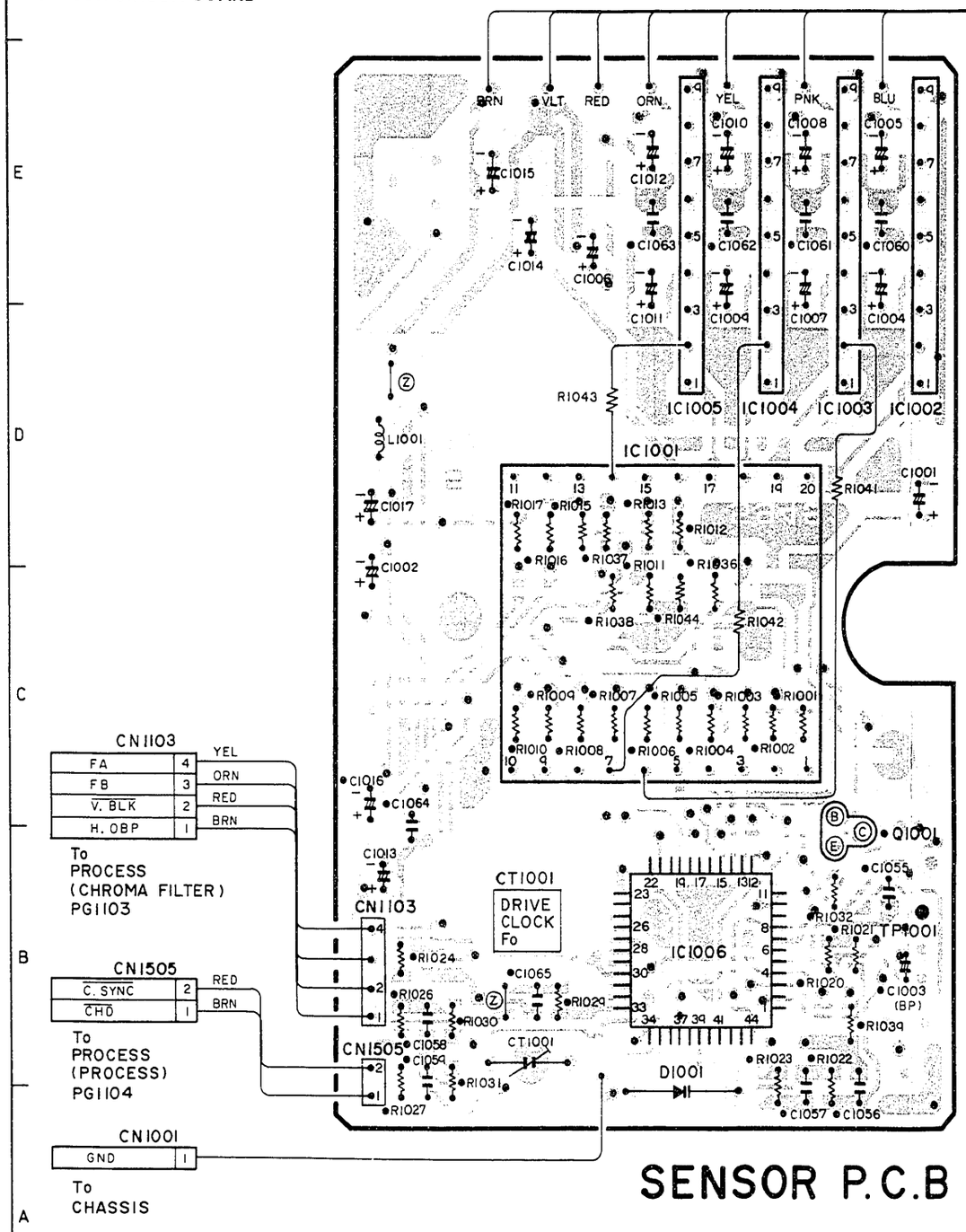
39. IC1006-41
1V/20 μsec. cm



40. IC1006-42
2V/20 μsec. cm



SENSOR CIRCUIT BOARD



CN1103

FA	4	YEL
FB	3	ORN
V. BLK	2	RED
H. OBP	1	BRN

To
PROCESS
(CHROMA FILTER)
PG1103

CN1505

C. SYNC	2	RED
CHD	1	BRN

To
PROCESS
(PROCESS)
PG1104

CN1001

GND	1	

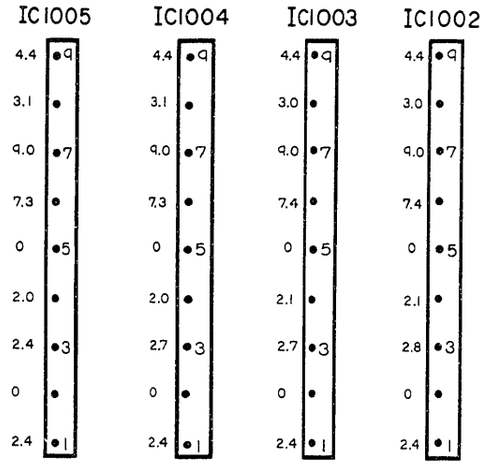
To
CHASSIS

CN1101

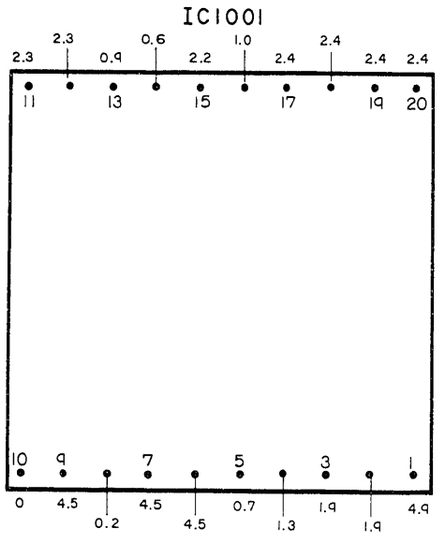
BRN	1	PB 5V
RED	2	PB 9V
ORN	3	YEL SIGNAL
YEL	4	WHT SIGNAL
PNK	5	CYAN SIGNAL
BLU	6	GRN SIGNAL
VLT	7	GND

To
PROCESS
(CHROMA FILTER)
PG1101

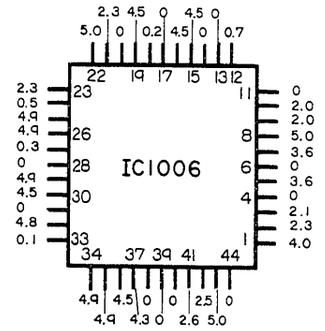
IC1005 IC1004 IC1003 IC1002



IC1001



IC1006

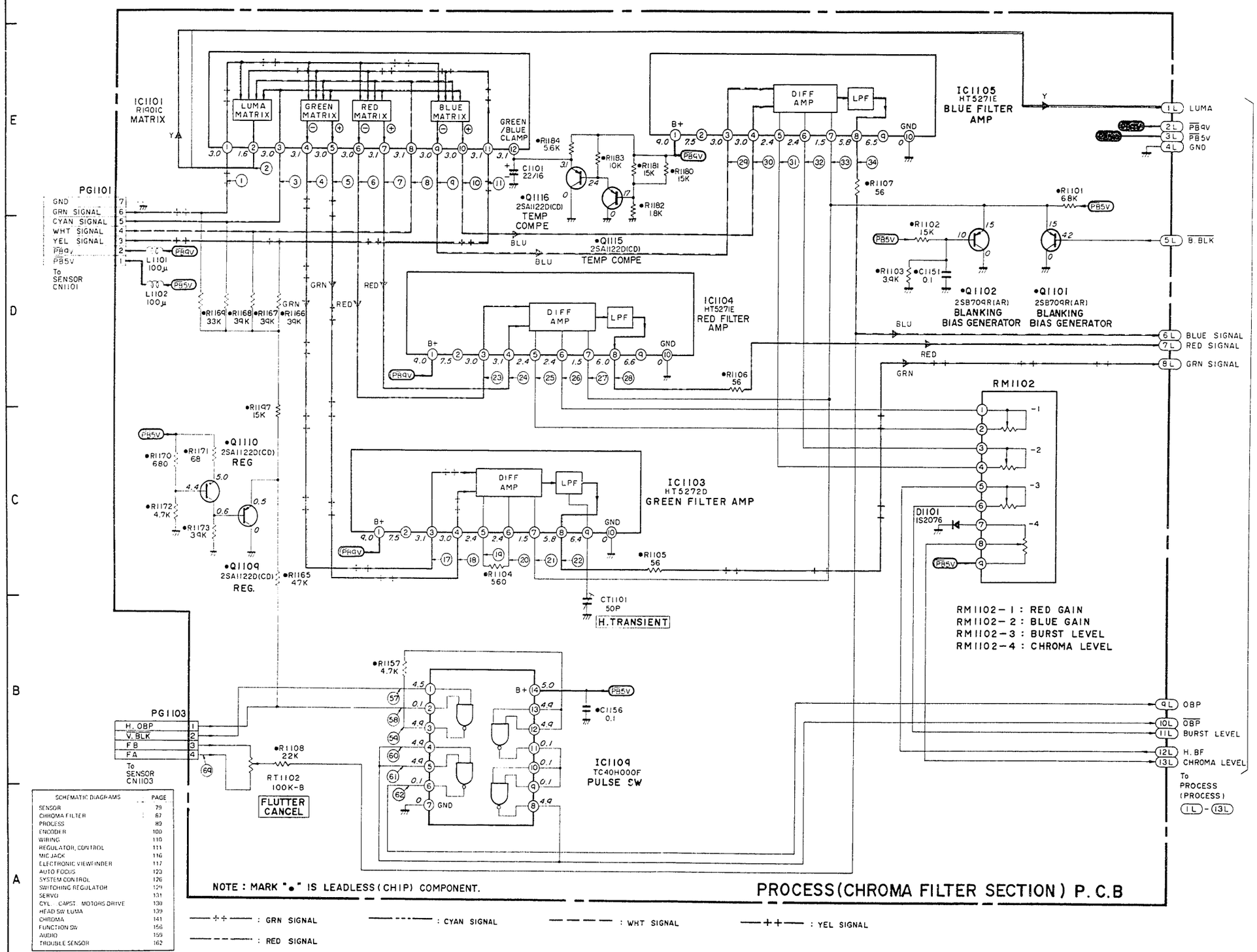


Soldered Side
Parts Side
● Through hole

NOTE : MARK "Ⓩ" IS LEADLESS (CHIP) JUMPER.
MARK "● " IS LEADLESS (CHIP) COMPONENT.

SENSOR P.C.B

PROCESS (CHROMA FILTER) SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL. CAPST. MOTORS DRIVE	138
HEAD SW. LUMA	139
CHROMA	141
FUNCTION SW.	156
AUDIO	159
TROUBLE SENSOR	162

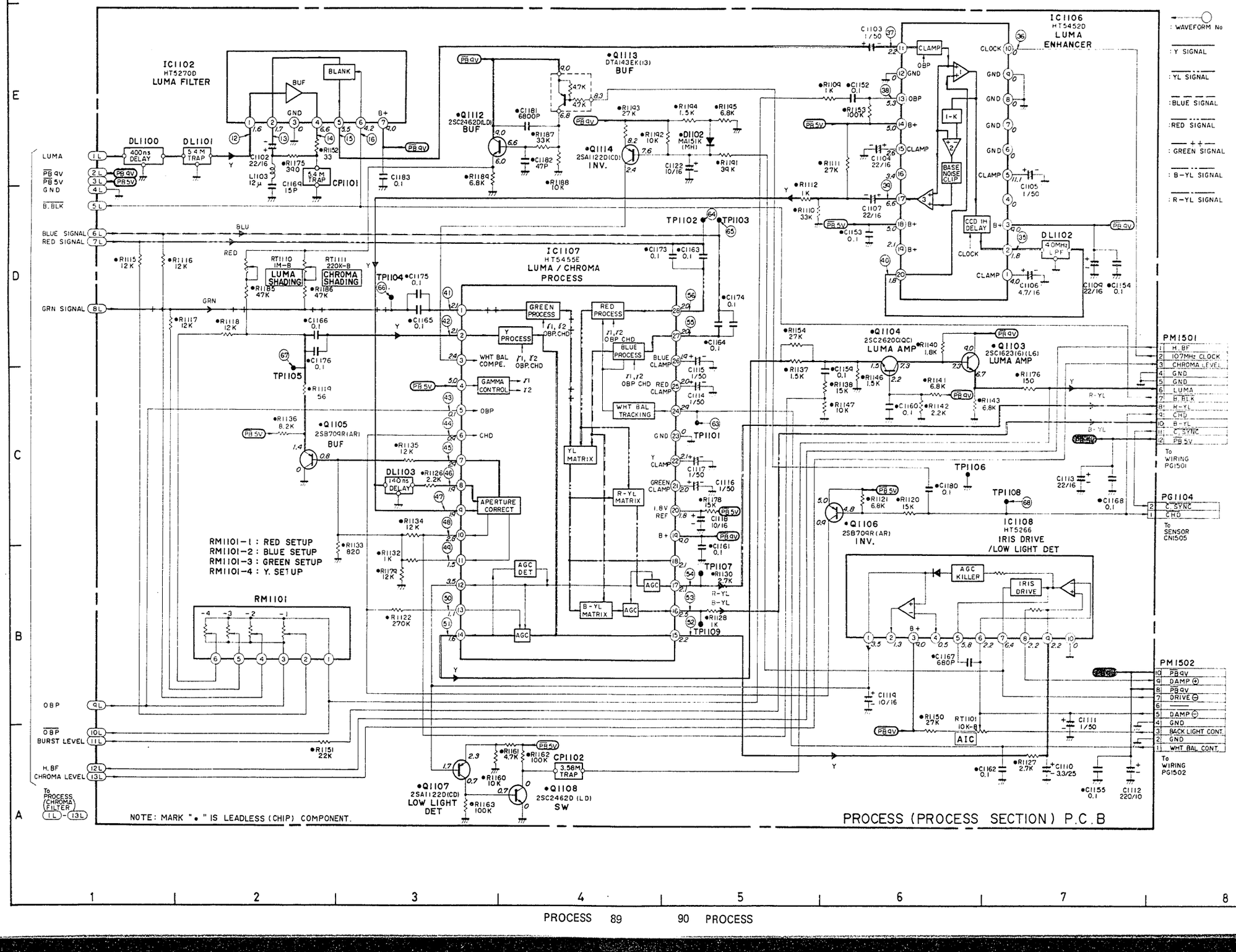
NOTE : MARK "•" IS LEADLESS (CHIP) COMPONENT.

PROCESS (CHROMA FILTER SECTION) P.C.B

—++— : GRN SIGNAL — — — : CYAN SIGNAL — — — : WHT SIGNAL —++— : YEL SIGNAL

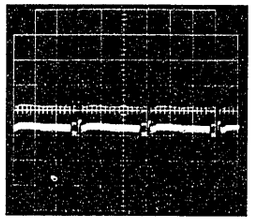
— — — : RED SIGNAL

PROCESS (PROCESS) SCHEMATIC DIAGRAM

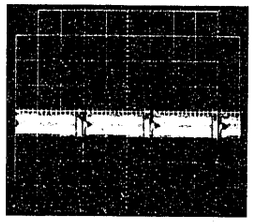


PROCESS WAVEFORMS

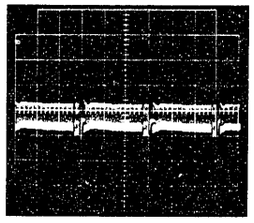
① IC1101-1
0.2V/20 μsec. cm



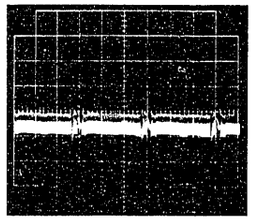
② IC1101-2
0.1V/20 μsec. cm



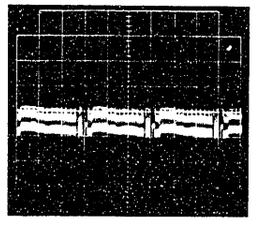
③ IC1101-3
0.2V/20 μsec. cm



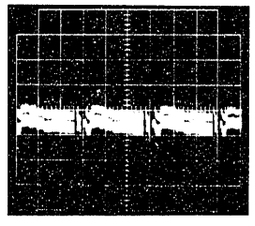
④ IC1101-4
0.1V/20 μsec. cm



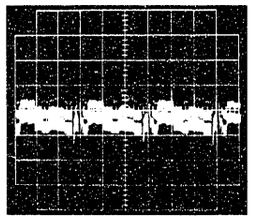
⑤ IC1101-5
0.1V/20 μsec. cm



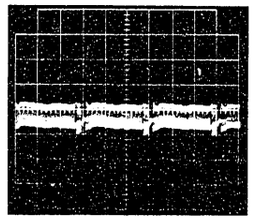
⑥ IC1101-6
50mV/20 μsec. cm



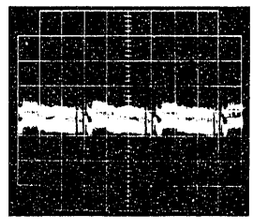
⑦ IC1101-7
50mV/20 μsec. cm



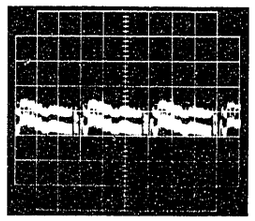
⑧ IC1101-8
0.2V/20 μsec. cm



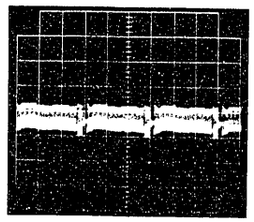
⑨ IC1101-9
50mV/20 μsec. cm



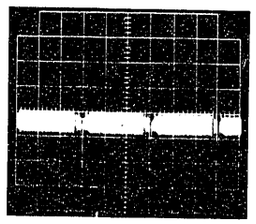
⑩ IC1101-10
50mV/20 μsec. cm



⑪ IC1101-11
0.2V/20 μsec. cm

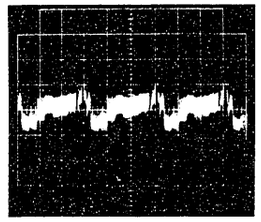


⑫ IC1102-1
50mV/20 μsec. cm

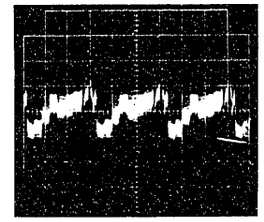


PROCESS WAVEFORMS

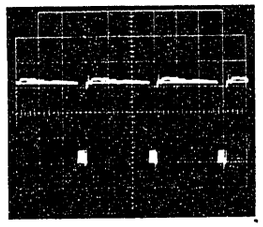
⑬ IC1102-2
50mV/20 μsec. cm



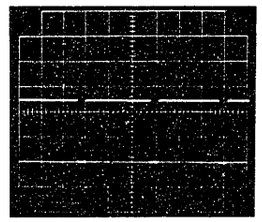
⑭ IC1102-4
50mV/20 μsec. cm



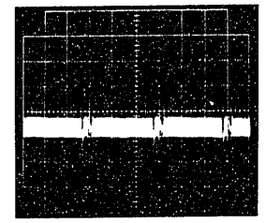
⑮ IC1102-5
1V/20 μsec. cm



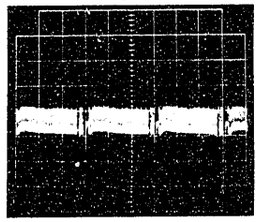
⑯ IC1102-6
2V/20 μsec. cm



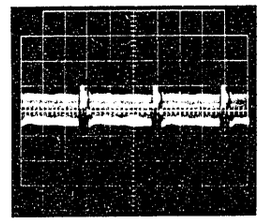
⑰ IC1103-3
0.1V/20 μsec. cm



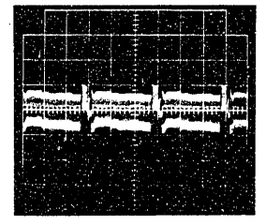
⑱ IC1103-4
0.1V/20 μsec. cm



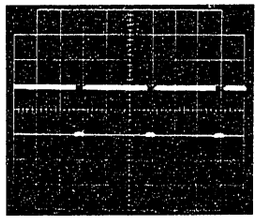
⑲ IC1103-5
0.1V/20 μsec. cm



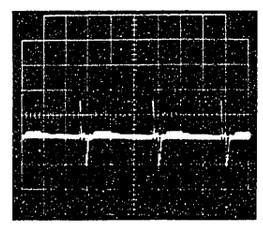
⑳ IC1103-6
0.1V/20 μsec. cm



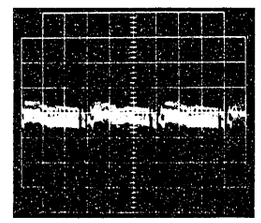
㉑ IC1103-7
0.5V/20 μsec. cm



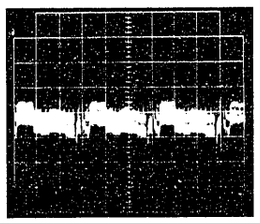
㉒ IC1103-8
0.5V/20 μsec. cm



㉓ IC1104-3
50mV/20 μsec. cm

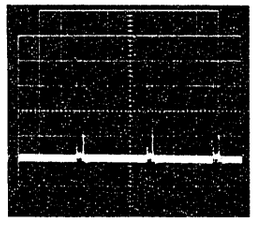


㉔ IC1104-4
50mV/20 μsec. cm

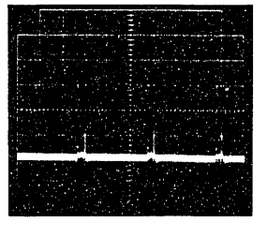


PROCESS CIRCUIT BOARD

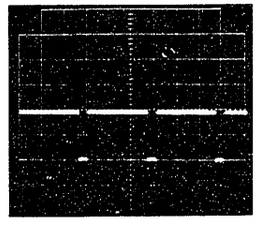
(25) IC1104-5
0.5V/20 μsec. cm



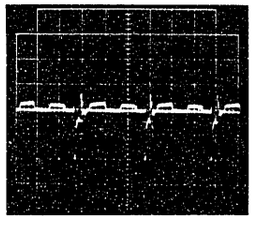
(26) IC1104-6
0.5V/20 μsec. cm



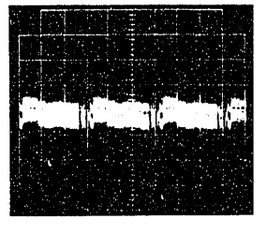
(27) IC1104-7
0.5V/20 μsec. cm



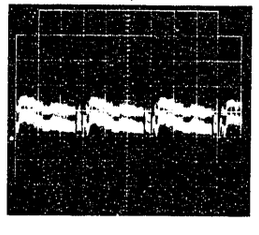
(28) IC1104-8
0.5V/20 μsec. cm



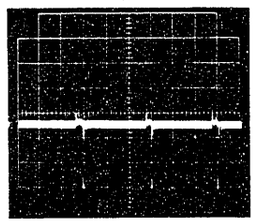
(29) IC1105-3
50mV/20 μsec. cm



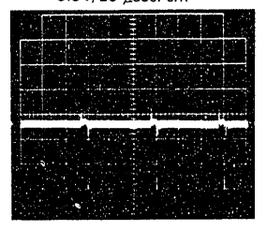
(30) IC1105-4
50mV/20 μsec. cm



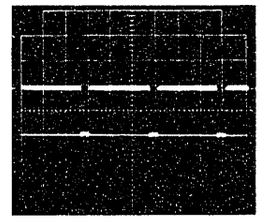
(31) IC1105-5
0.5V/20 μsec. cm



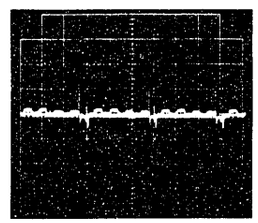
(32) IC1105-6
0.5V/20 μsec. cm



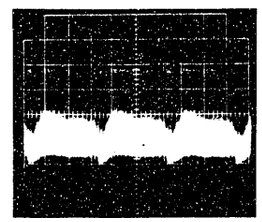
(33) IC1105-7
0.5V/20 μsec. em



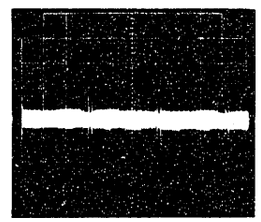
(34) IC1105-8
0.5V/20 μsec. cm



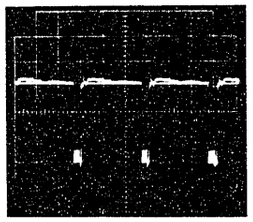
(35) IC1106-2
0.5V/20 μsec. cm



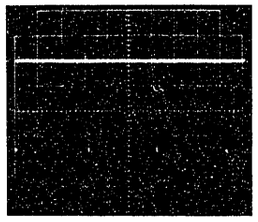
(36) IC1106-10
0.1V/20 μsec. cm



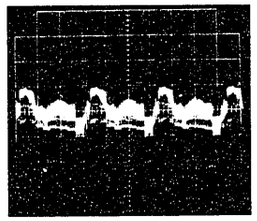
37 IC1106-11
1V/20 μsec. cm



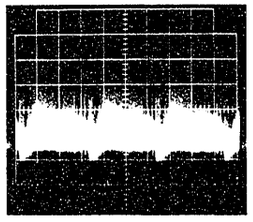
38 IC1106-13
1V/20 μsec. cm



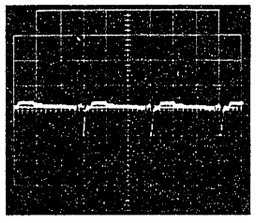
39 IC1106-17
0.5V/20 μsec. cm



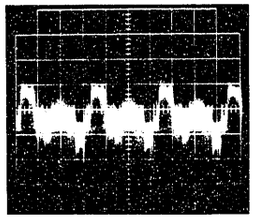
40 IC1106-20
0.5V/20 μsec. cm



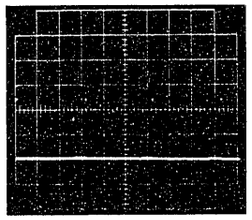
41 IC1107-1
0.5V/20 μsec. cm



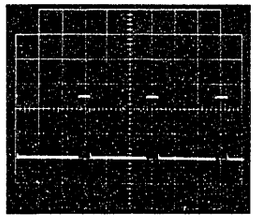
42 IC1107-2
0.2V/20 μsec. cm



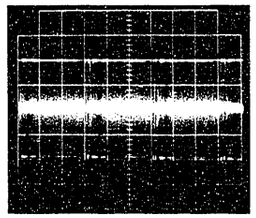
43 IC1107-5
2V/20 μsec. cm



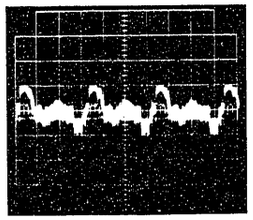
44 IC1107-6
2V/20 μsec. cm



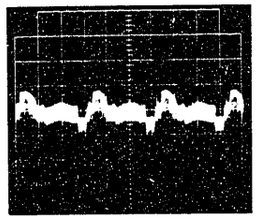
45 IC1107-7
0.5V/20 μsec. cm



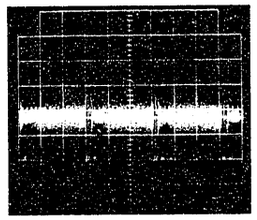
46 IC1107-8
0.5V/20 μsec. cm



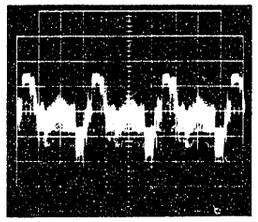
47 IC1107-9
0.5V/20 μsec. cm



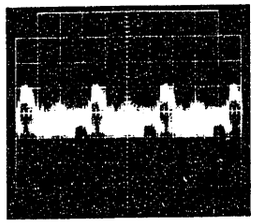
48 IC1107-10
0.5V/20 μsec. cm



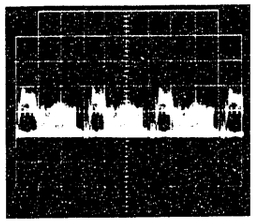
49 IC1107-11
0.2V/20 μsec. cm



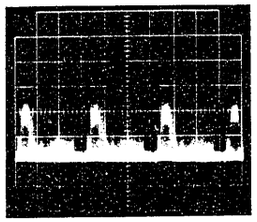
50 IC1107-13
50mV/20 μsec. cm



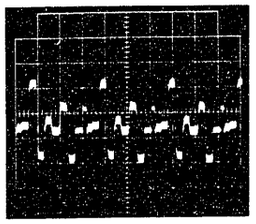
51 IC1107-14
0.5V/20 μsec. cm



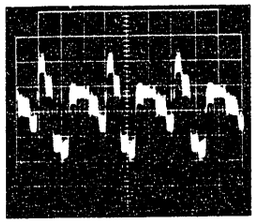
52 IC1107-15
0.1V/20 μsec. cm



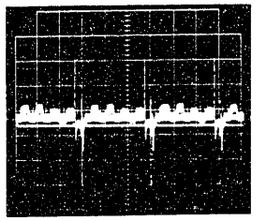
53 IC1107-16
0.2V/20 μsec. cm



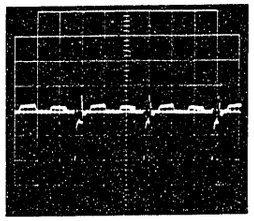
54 IC1107-17
0.1V/20 μsec. cm



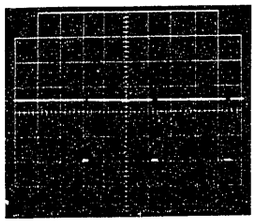
55 IC1107-27
0.2V/20 μsec. cm



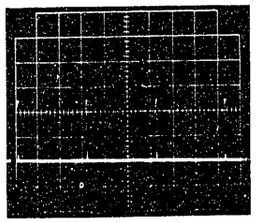
56 IC1107-28
0.5V/20 μsec. cm



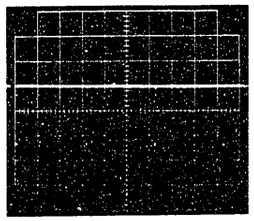
57 IC1109-1
2V/ 5msec. cm



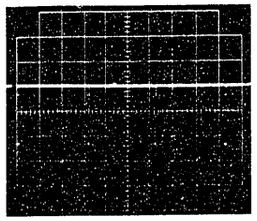
58 IC1109-2
2V/20 μsec. cm



59 IC1109-3
2V/20 μsec. cm

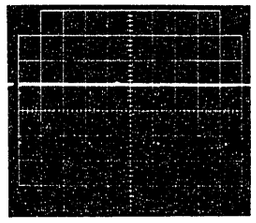


60 IC1109-4
2V/20 μsec. cm

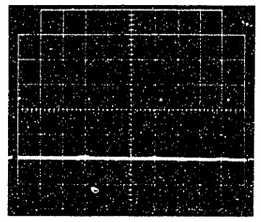


PROCESS WAVEFORMS

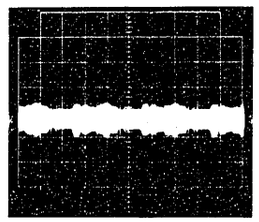
(61) IC1109-5
2V/20 μsec. cm



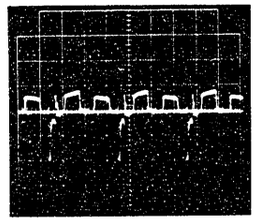
(62) IC1109-6
2V/20 μsec. cm



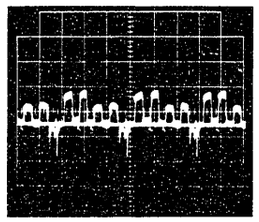
(63) TP1101
50mV/20 μsec. cm



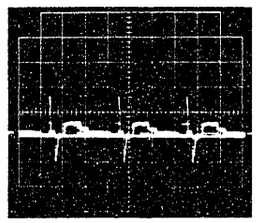
(64) TP1102
0.5V/20 μsec. cm



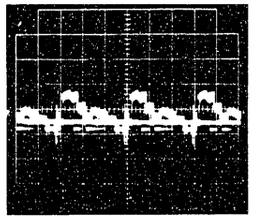
(65) TP1103
0.2V/20 μsec. cm



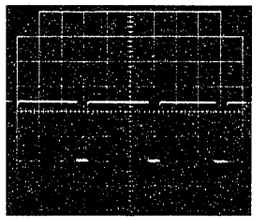
(66) TP1104
0.5V/20 μsec. cm



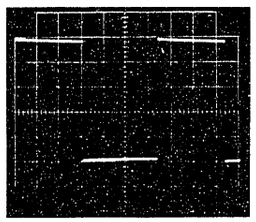
(67) TP1105
0.2V/20 μsec. cm



(68) TP1108
2V/20 μsec. cm



(69) PG1103-4
1V/ 5msec. cm



PROCESS CIRCUIT BOARD

RM1102 - 1: RED GAIN
RM1102 - 2: BLUE GAIN
RM1102 - 3: BURST LEVEL
RM1102 - 4 CHROMA LEVEL

RM1101 - 1: RED SETUP
RM1101 - 2: BLUE SETUP
RM1101 - 3: GREEN SETUP
RM1101 - 4: Y SETUP

CHROMA SHADING
LUMA SHADING
FLUTTER CANCEL
AIC
H.TRANSIENT

PG1101	
7	GND
6	GRN SIGNAL
5	CYAN SIGNAL
4	WHT SIGNAL
3	YEL SIGNAL
2	$\overline{PB}$qV
1	PB5V

To SENSOR CN1101

PG1103	
1	H. OBP
2	$\overline{V.BLK}$
3	FB
4	FA

To SENSOR CN1103

PG1104	
2	$\overline{C.SYNC}$
1	CHD

To SENSOR CN1505

PM1501	
1	H.BF
2	10.7MHz CLOCK
3	CHROMA LEVEL
4	GND
5	GND
6	LUMA
7	$\overline{B.BLK}$
8	R-YL
9	$\overline{CHD}$
10	B-YL
11	$\overline{C.SYNC}$
12	$\overline{PB5V}$

To WIRING PG1501

PM1502	
10	$\overline{PB}$qV
9	DAMP ⊕
8	$\overline{PB}$qV
7	DRIVE ⊖
6	——
5	DAMP ⊖
4	GND
3	BACK LIGHT CONT.
2	GND
1	WHT BAL CONT.

To WIRING PG1502

Soldered side

Parts side

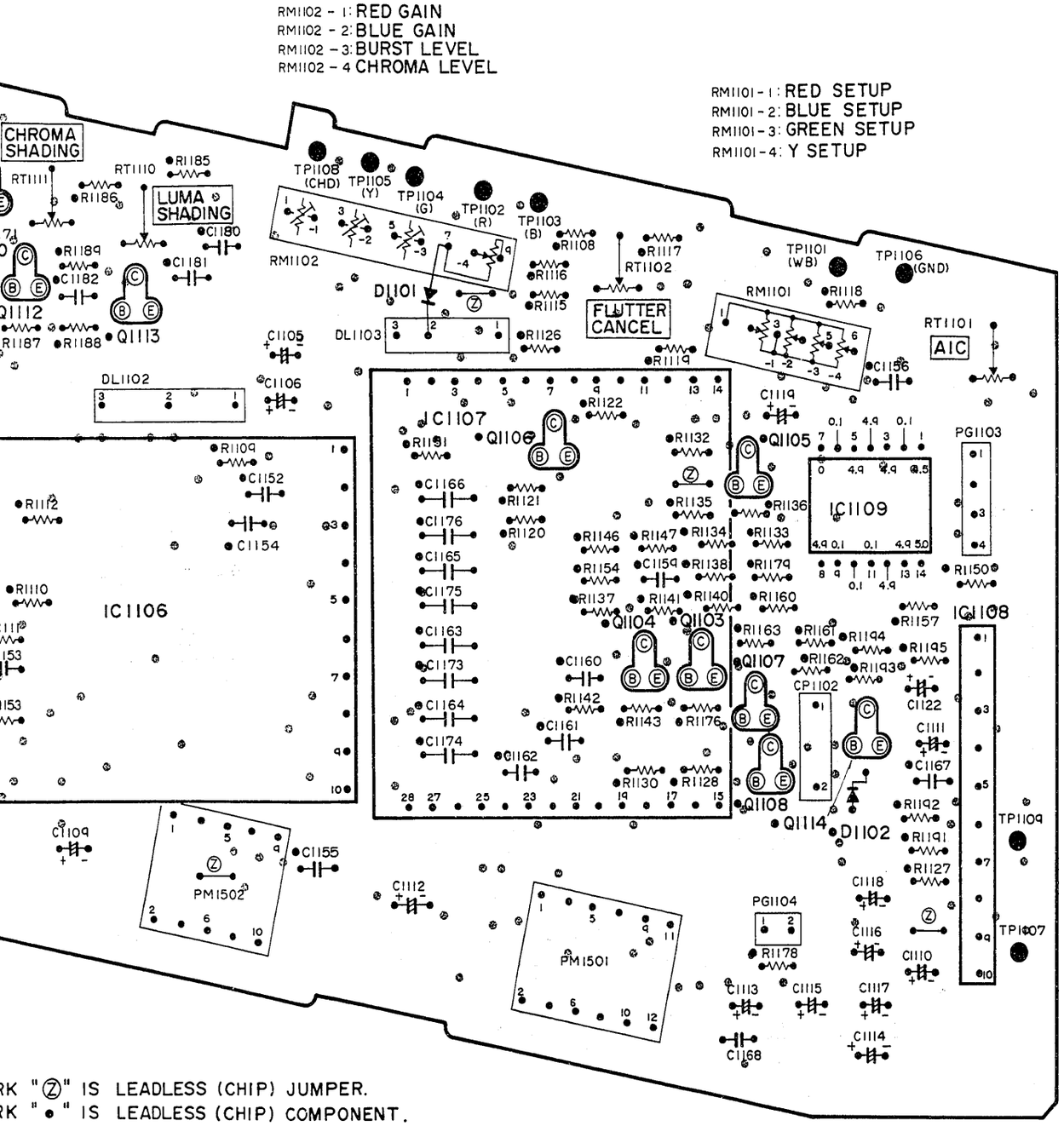
Through hole

NOTE : MARK "Ⓩ" IS LEADLESS (CHIP) JUMPER.
MARK " • " IS LEADLESS (CHIP) COMPONENT.

PROCESS P.C.B

RM1102 - 1: RED GAIN
RM1102 - 2: BLUE GAIN
RM1102 - 3: BURST LEVEL
RM1102 - 4 CHROMA LEVEL

RM1101 - 1: RED SETUP
RM1101 - 2: BLUE SETUP
RM1101 - 3: GREEN SETUP
RM1101 - 4: Y SETUP



PG1101	
7	GND
6	GRN SIGNAL
5	CYAN SIGNAL
4	WHT SIGNAL
3	YEL SIGNAL
2	$\overline{PB9V}$
1	$\overline{PB5V}$

To SENSOR CN1101

PG1103	
1	H. OBP
2	$\overline{V.BLK}$
3	FB
4	FA

To SENSOR CN1103

PG1104	
2	$\overline{C.SYNC}$
1	$\overline{CHD}$

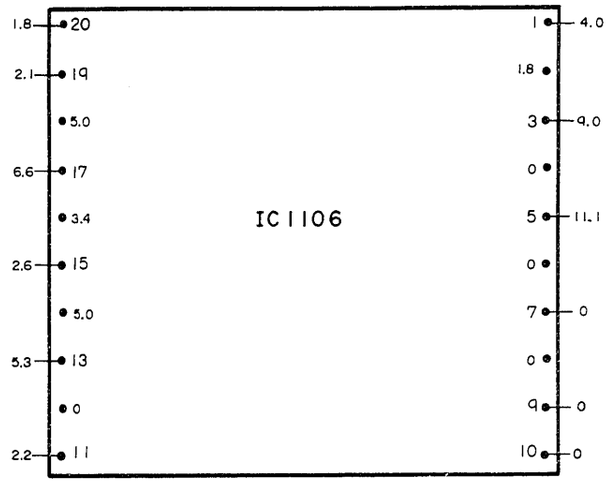
To SENSOR CN1505

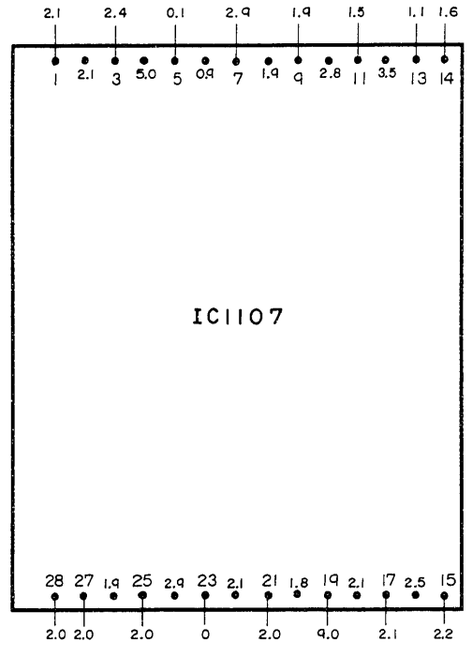
PM1501	
1	H.BF
2	10.7MHz CLOCK
3	CHROMA LEVEL
4	GND
5	GND
6	LUMA
7	$\overline{B.BLK}$
8	R-YL
9	$\overline{CHD}$
10	B-YL
11	$\overline{C.SYNC}$
12	$\overline{PB5V}$

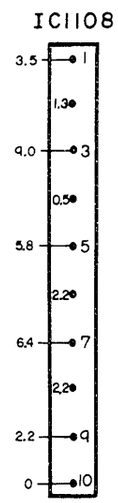
To WIRING PG1501

PM1502	
10	$\overline{PB9V}$
9	DAMP ⊕
8	$\overline{PB9V}$
7	DRIVE ⊖
6	——
5	DAMP ⊖
4	GND
3	BACK LIGHT CONT.
2	GND
1	WHT BAL CONT.

To WIRING PG1502







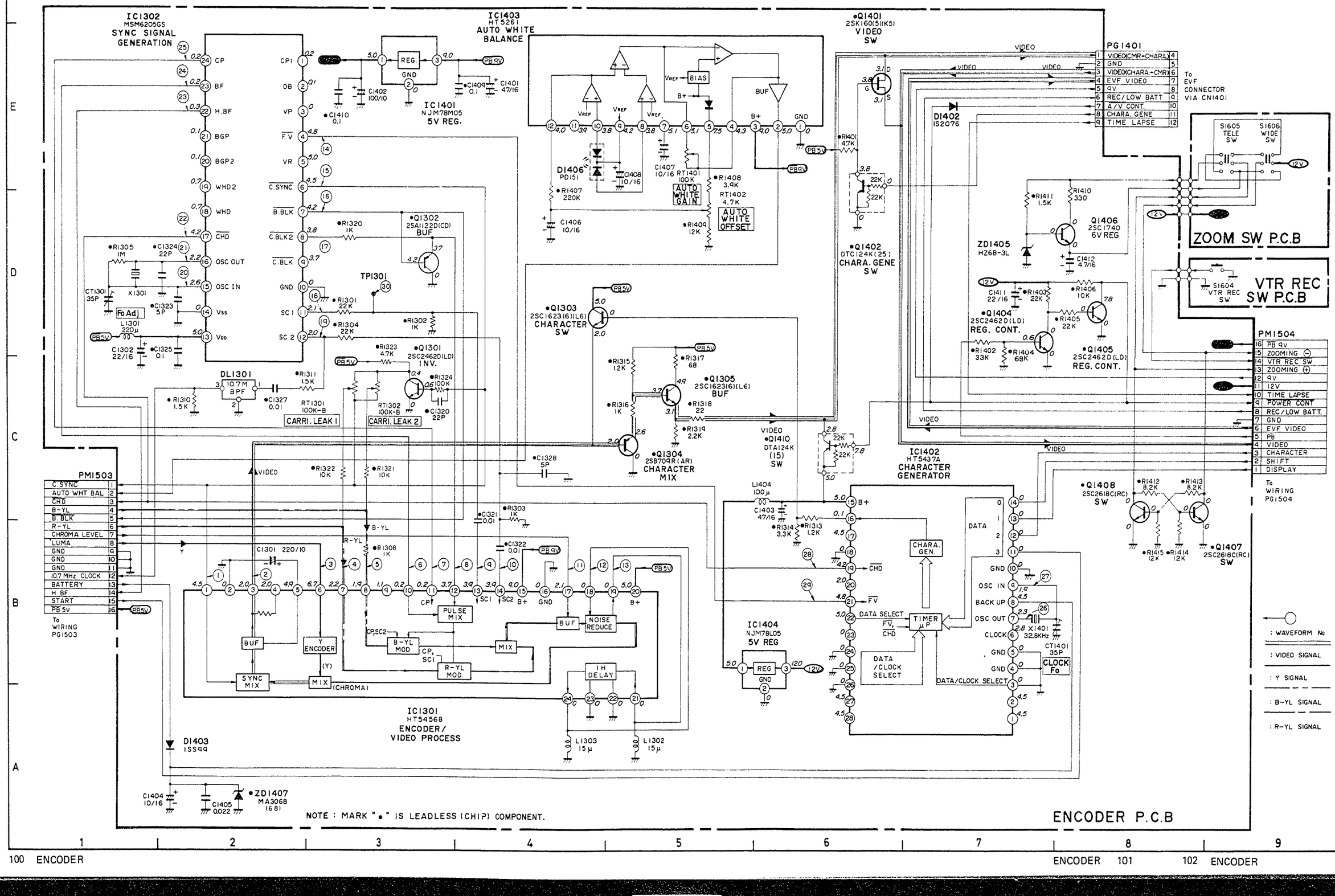
MARK "Ⓩ" IS LEADLESS (CHIP) JUMPER.
MARK "•" IS LEADLESS (CHIP) COMPONENT.

PROCESS P.C.B

3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12

PROCESS 97 98 PROCESS PROCESS 99

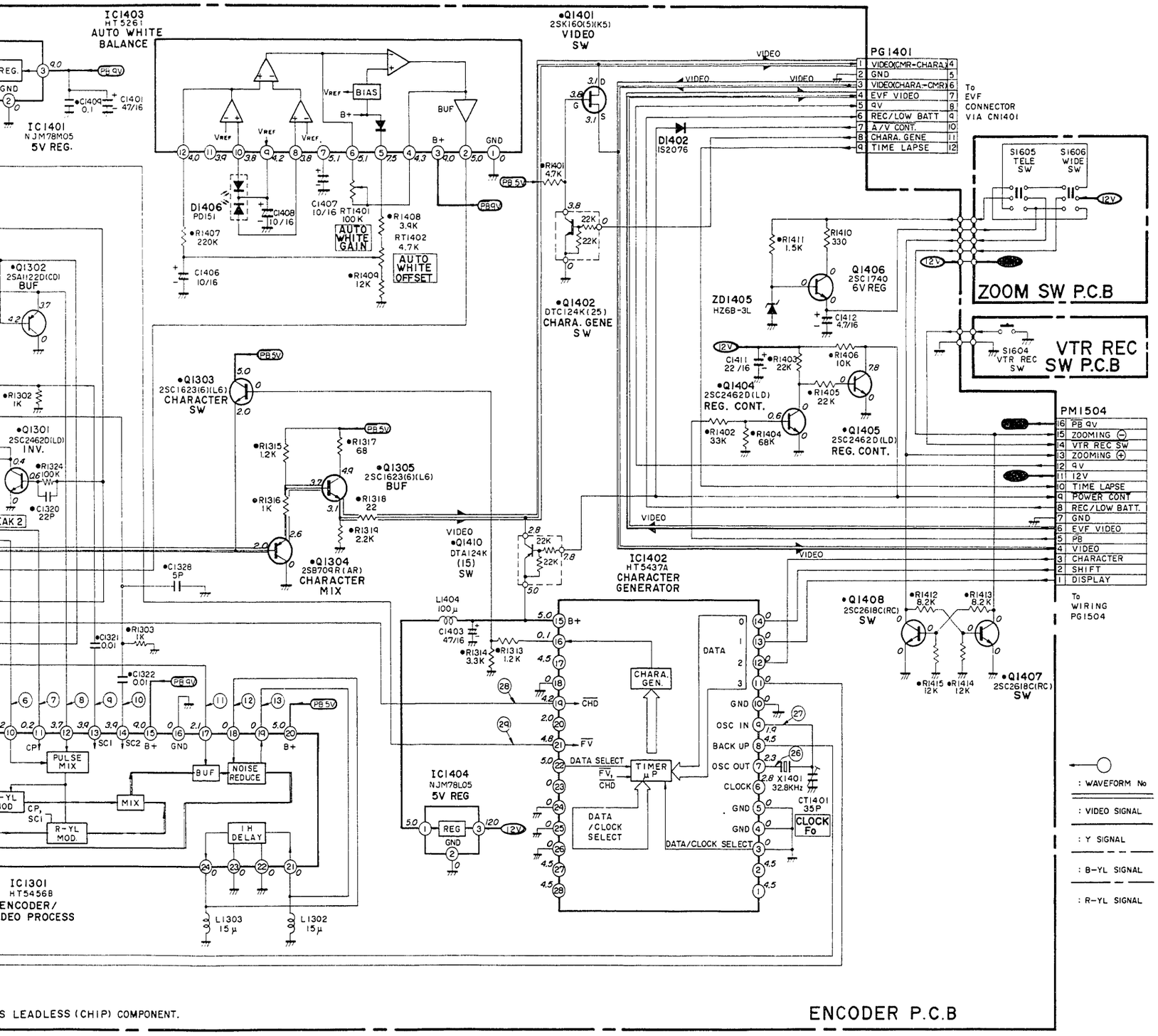
ENCODER SCHEMATIC DIAGRAM



100 ENCODER

ENCODER 101

102 ENCODER



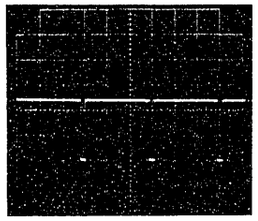
S LEADLESS (CHIP) COMPONENT.

ENCODER P.C.B

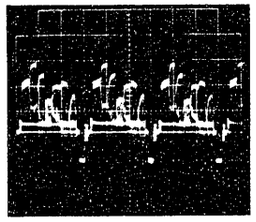
SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL. CAPST. MOTORS DRIVE	133
HEAD SW LUMA	139
CHROMA	141
FUNCTION SW	146
AUDIO	159
TROUBLE SENSOR	162

ENCODER WAVEFORMS

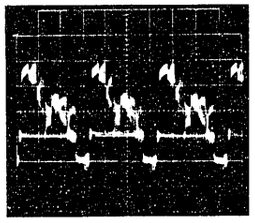
① IC1301-1
2V/20 μsec. cm



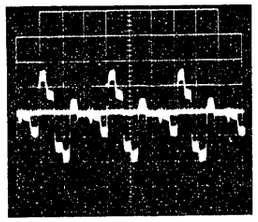
② IC1301-3
0.5V/20 μsec. cm



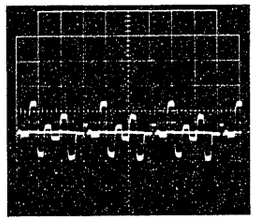
③ IC1301-6
0.2V/20 μsec. cm



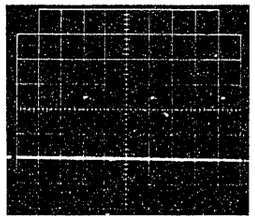
④ IC1301-7
0.2V/20 μsec. cm



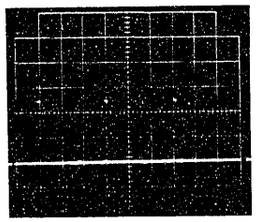
⑤ IC1301-8
0.5V/20 μsec. cm



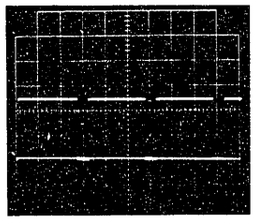
⑥ IC1301-10
2V/20 μsec. cm



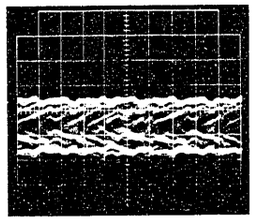
⑦ IC1301-11
2V/20 μsec. cm



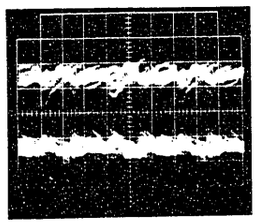
⑧ IC1301-12
2V/20 μsec. cm



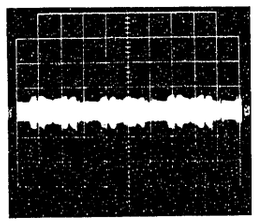
⑨ IC1301-13
50mV/20 μsec. cm



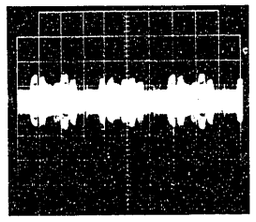
⑩ IC1301-14
50mV/20 μsec. cm



⑪ IC1301-15
50mV/20 μsec. cm

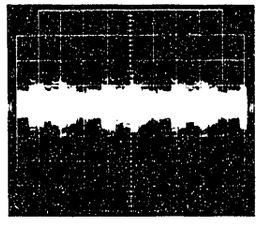


⑫ IC1301-18
50mV/20 μsec. cm

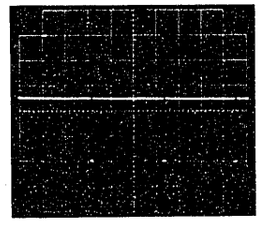


ENCODER WAVEFORMS

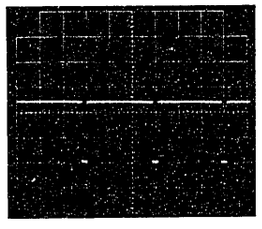
⑬ IC1301-19
50mV/20 μsec. cm



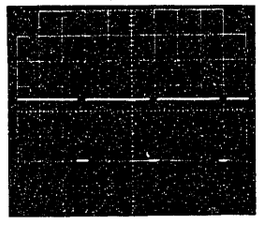
⑭ IC1302-4
2V/5m sec. cm



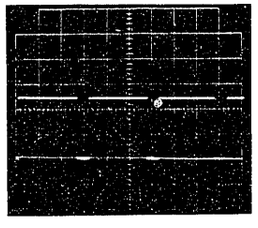
⑮ IC1302-6
2V/20 μsec. cm



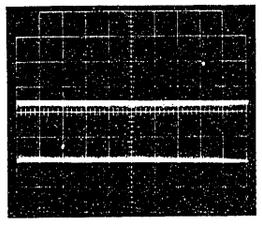
⑯ IC1302-7
2V/20 μsec. cm



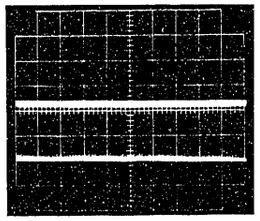
⑰ IC1302-9
2V/20 μsec. cm



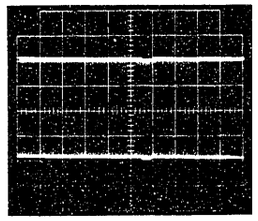
⑱ IC1302-11
2V/20 μsec. cm



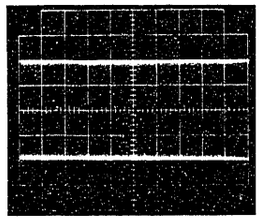
⑲ IC1302-12
2V/20 μsec. cm



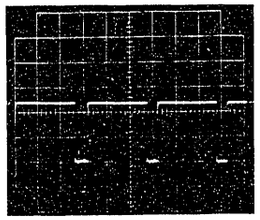
⑳ IC1302-15
0.5V/20 μsec. cm



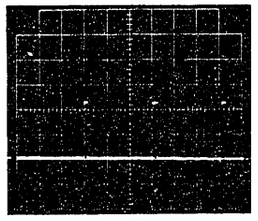
㉑ IC1302-16
1V/20 μsec. cm



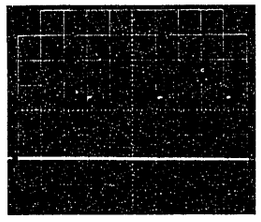
㉒ IC1302-17
2V/20 μsec. cm



㉓ IC1302-22
2V/20 μsec. cm

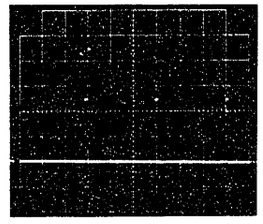


㉔ IC1302-23
2V/20 μsec. cm

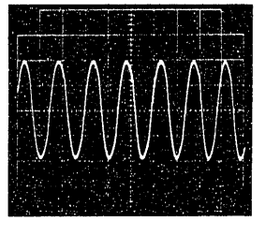


ENCODER WAVEFORMS

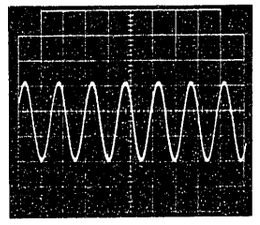
㉕ IC1302-24
2V/20 μsec. cm



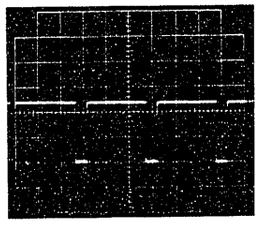
㉖ IC1402-7
0.5V/20 μsec. cm



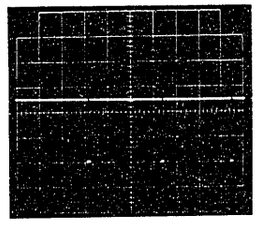
㉗ IC1402-9
1V/20 μsec. cm



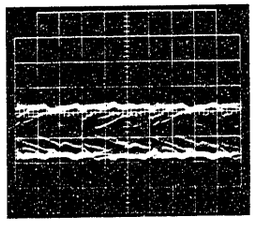
㉘ IC1402-19
2V/20 μsec. cm



㉙ IC1402-21
2V/5m sec. cm



㉚ TP1301
0.1V/20 μsec. cm



ENCODER CIRCUIT BOARD

IC1301

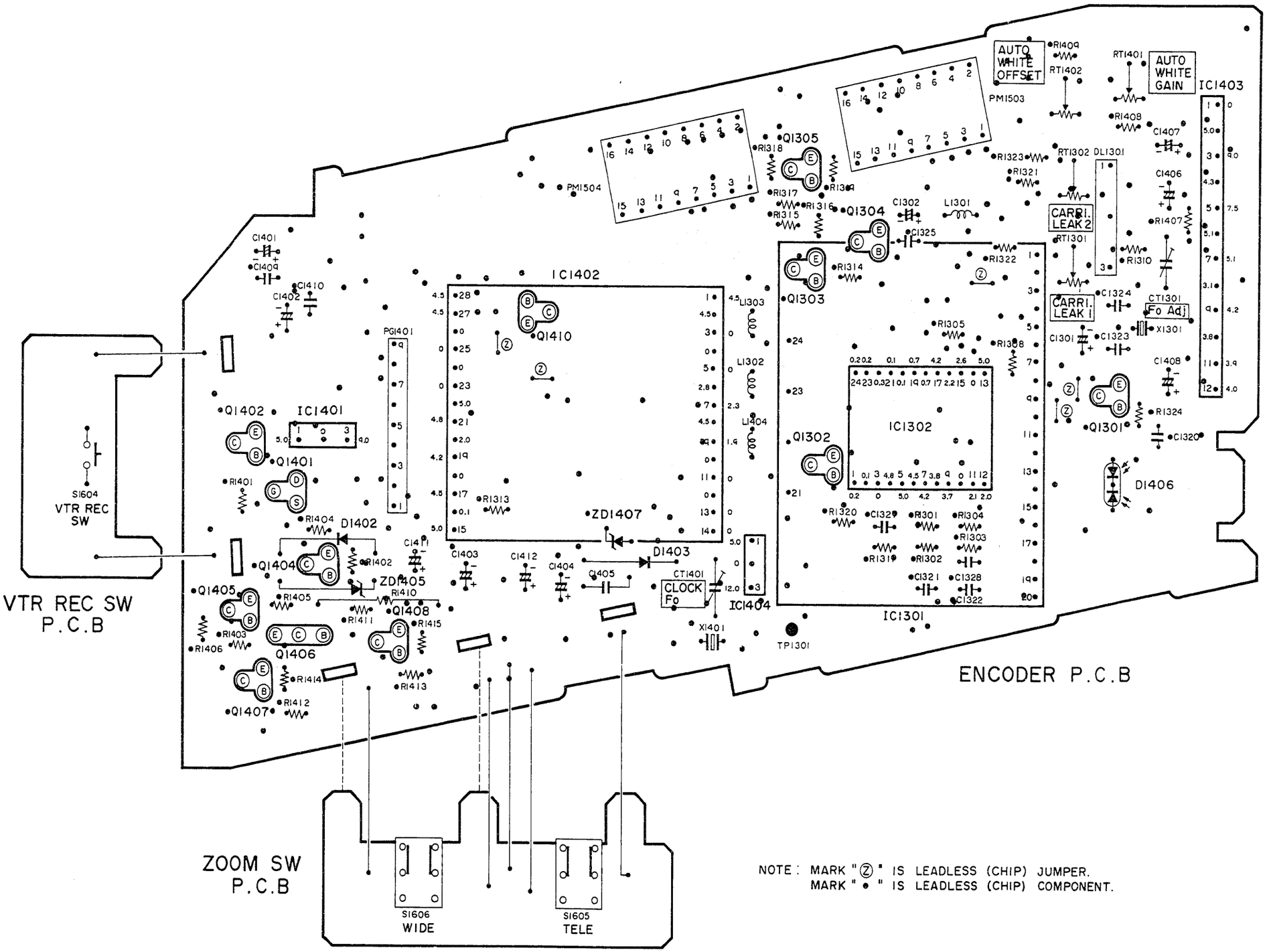
VTR REC SW P.C.B

ZOOM SW P.C.B

NOTE : MARK "Ⓩ" IS LEADLESS (CHIP) JUMPER.
MARK "●" IS LEADLESS (CHIP) COMPONE

ENCODER P.

ENCODER 107 108 ENCODER



PM1503

16	$\overline{PB}$ 5V	
15	START	
14	H.BF	
13	BATTERY	
12	10.7MHz CLOCK	
11	GND	
10	GND	
9	GND	
8	LUMA	
7	CHROMA LEVEL	
6	R—YL	
5	$\overline{B.BLK}$	
4	B—YL	
3	$\overline{CHD}$	
2	AUTO WHT BAL	
1	$\overline{C.SYNC}$	

To WIRING PG1503

PG1401

9	TIME LAPSE	12
8	CHARA. GENE	11
7	$\overline{A/V\ CONT.}$	10
6	REC/LOW BATT	9
5	9V	8
4	EVF VIDEO	7
3	VIDEO(CHARA→CMR)	6
2	GND	5
1	VIDEO(CMR→CHARA)	4

To EVF CONNECTOR VIA CN1401

PM1504

16	$\overline{PB}$ 9V	
15	ZOOMING ⊖	
14	VTR REC SW	
13	ZOOMING ⊕	
12	9V	
11	12V	
10	TIME LAPSE	
9	$\overline{POWER\ CONT.}$	
8	REC/LOW BATT.	
7	GND	
6	EVF VIDEO	
5	$\overline{PB}$	
4	VIDEO	
3	CHARACTER	
2	SHIFT	
1	DISPLAY	

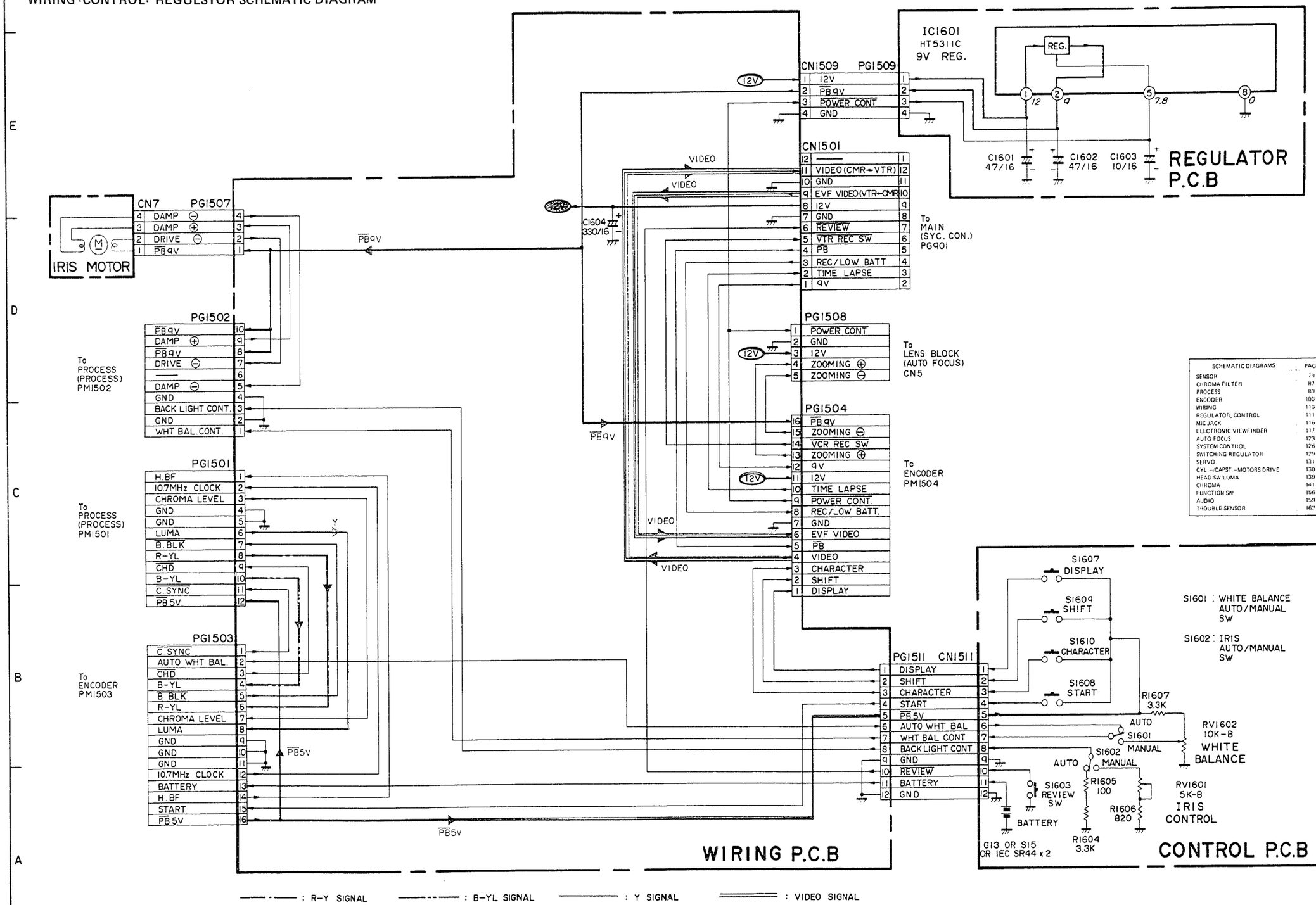
To WIRING PG1504

Soldered side

Parts side

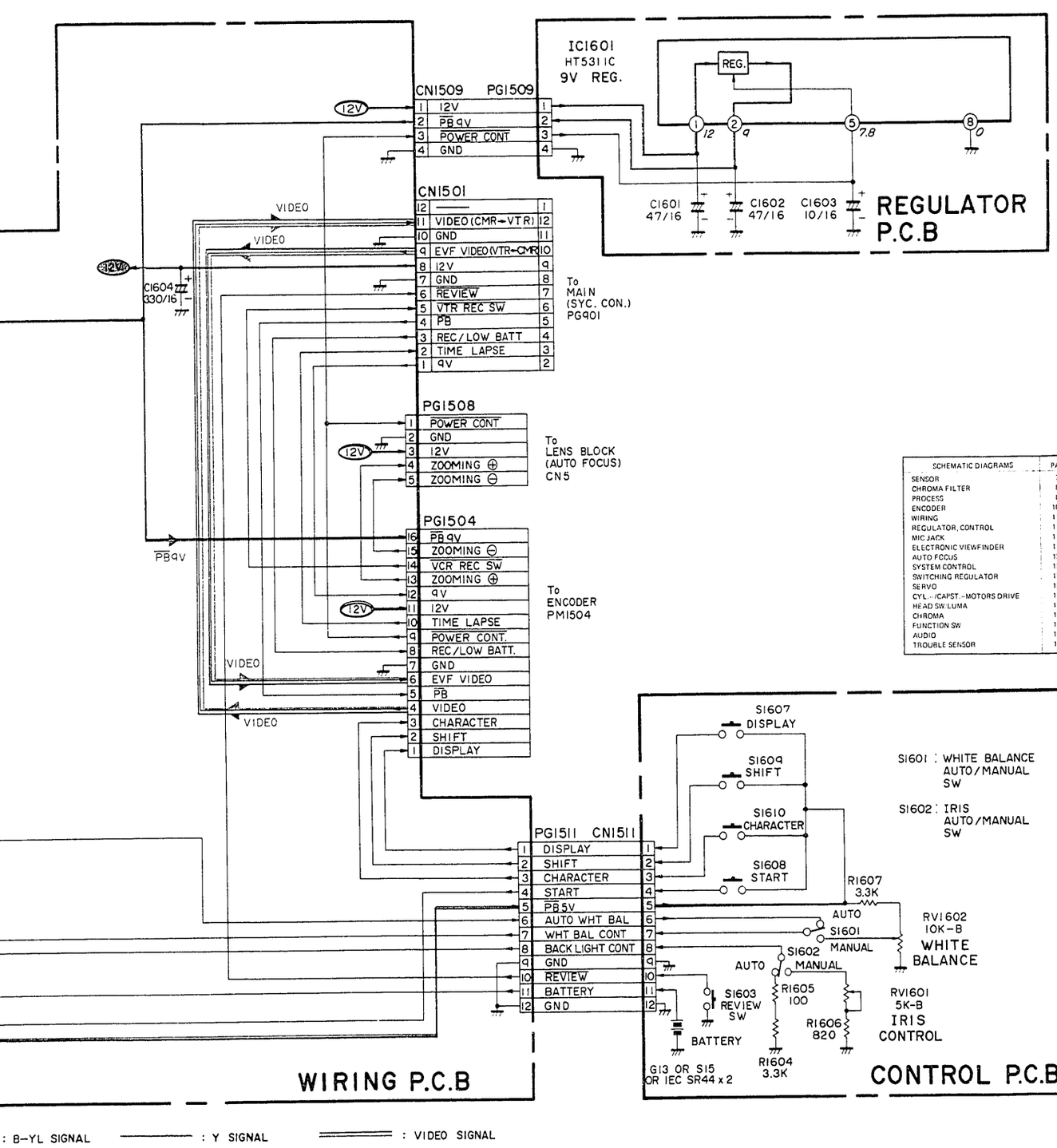
● Through hole

NOTE : MARK "Ⓩ" IS LEADLESS (CHIP) JUMPER.
MARK "●" IS LEADLESS (CHIP) COMPONENT.

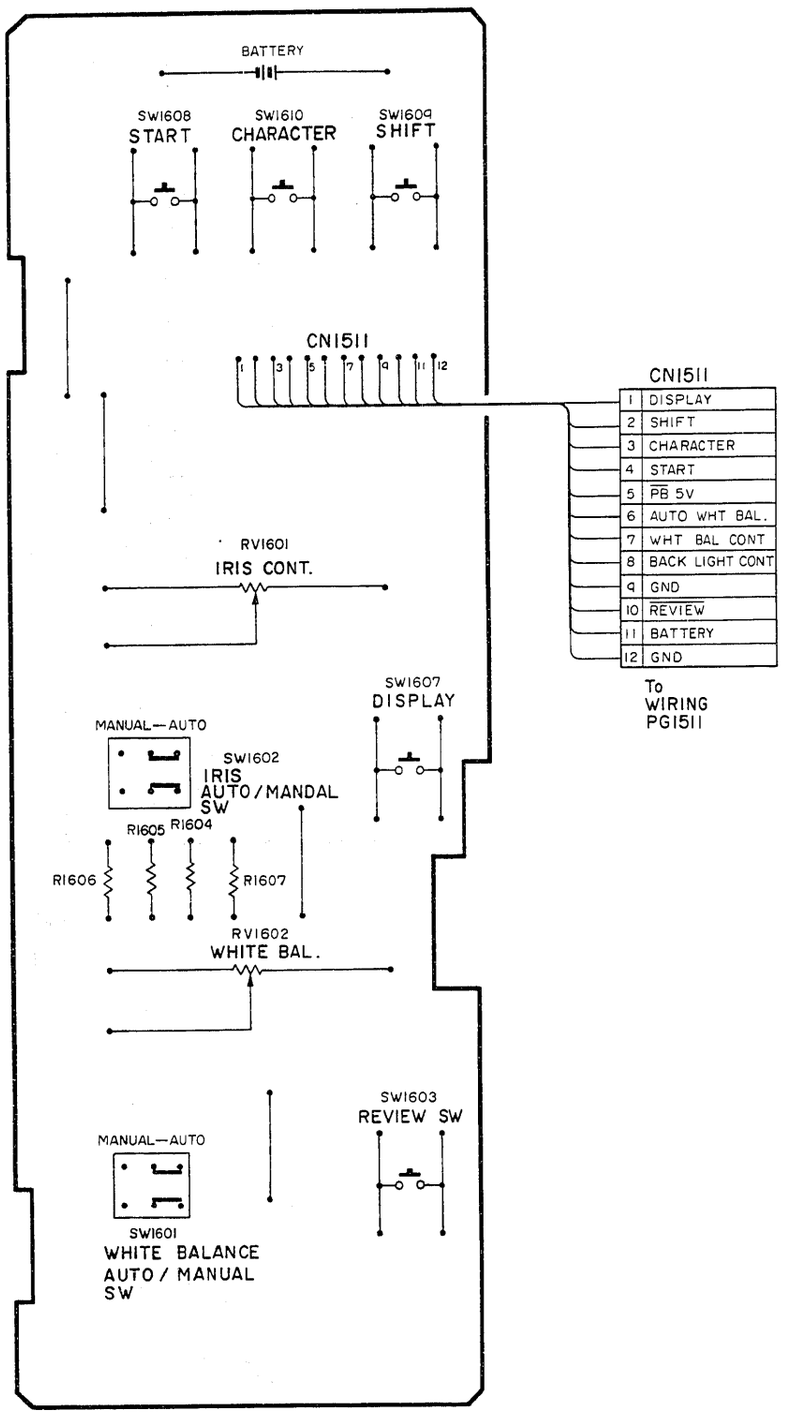


SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL.-/CAPST.-MOTORS DRIVE	138
HEAD SW/LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

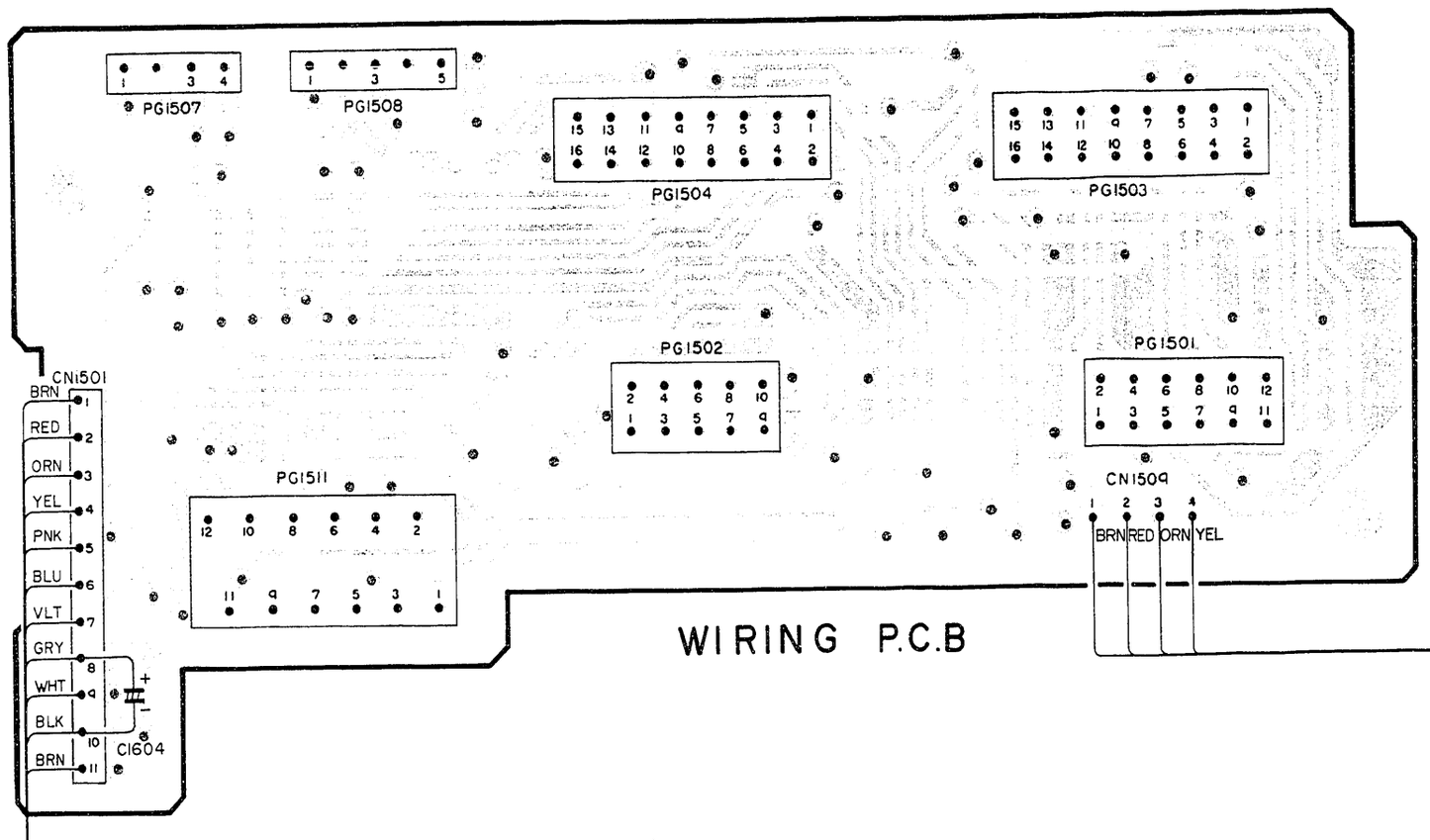
CONTROL CIRCUIT BOARD



SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL.-/CAPST.-MOTORS DRIVE	130
HEAD SW/LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162



WIRING CIRCUIT BOARD



PG1507

4	DAMP ⊖
3	DAMP ⊕
2	DRIVE ⊖
1	$\overline{PB}$ 9V

To LENS BLOCK (IRIS MOTOR) CN7

PG1508

1	$\overline{POWER\ CONT.}$
2	GND
3	12V
4	ZOOMING ⊕
5	ZOOMING ⊖

To LENS BLOCK (AUTO FOCUS) CN5

PG1511

1	DISPLAY
2	SHIFT
3	CHARACTER
4	START
5	$\overline{PB}$ 5V
6	AUTO WHT BAL
7	WHT BAL CONT.
8	BACK LIGHT CONT.
9	GND
10	$\overline{REVIEW}$
11	BATTERY
12	GND

To CONTROL CN1511

CN1509

BRN	1	12V
RED	2	$\overline{PB}$ 9V
ORN	3	$\overline{POWER\ CONT.}$
YEL	4	GND

To REGULATOR PG1509

CN1501

BRN	1	9V	2
RED	2	TIME LAPSE	3
ORN	3	REC/LOW BATT.	4
YEL	4	$\overline{PB}$	5
PNK	5	$\overline{VTR\ REC\ SW}$	6
BLU	6	$\overline{REVIEW}$	7
VLT	7	GND	8
GRY	8	12V	9
WHT	9	EVF VIDEO(VTR→CMR)	10
BLK	10	GND	11
BRN	11	VIDEO(CMR→VTR)	12
	12	——	1

To MAIN (SYS.CON) PG901

PG1501

1	H.BF
2	10.7MHz CLOCK
3	CHROMA LEVEL
4	GND
5	GND
6	LUMA
7	$\overline{B.BLK}$
8	R-YL
9	$\overline{CHD}$
10	B-YL
11	$\overline{C.SYNC}$
12	$\overline{PB}$ 5V

To PROCESS (PROCESS) PM1501

PG1502

10	$\overline{PB}$ 9V
9	DAMP ⊕
8	$\overline{PB}$ 9V
7	DRIVE ⊖
6	——
5	DAMP ⊖
4	GND
3	BACK LIGHT CONT.
2	GND
1	WHT BAL CONT.

To PROCESS (PROCESS) PM1502

PG1503

1	$\overline{C.SYNC}$
2	AUTO WHT BAL
3	$\overline{CHD}$
4	B-YL
5	$\overline{B.BLK}$
6	R-YL
7	CHROMA LEVEL
8	LUMA
9	GND
10	GND
11	GND
12	10.7MHz CLOCK
13	BATTERY
14	H.BF
15	START
16	$\overline{PB}$ 5V

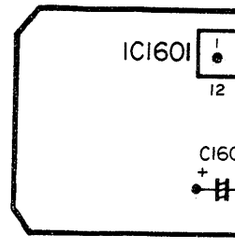
To ENCODER PM1503

PG1504

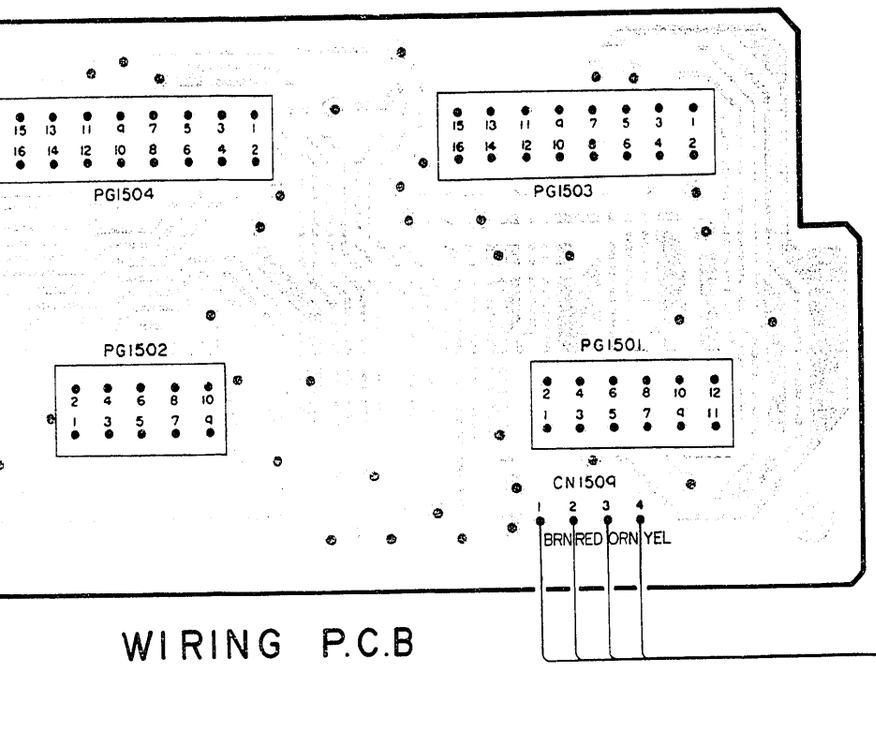
16	$\overline{PB}$ 9V
15	ZOOMING ⊖
14	$\overline{VTR\ REC\ SW}$
13	ZOOMING ⊕
12	9V
11	12V
10	TIME LAPSE
9	$\overline{POWER\ CONT.}$
8	REC/LOW BATT.
7	GND
6	EVF VIDEO
5	$\overline{PB}$
4	VIDEO
3	CHARACTER
2	SHIFT
1	DISPLAY

To ENCODER PM1504

REGULATOR CIRCUIT



Soldered S
Parts Side
◎ Through ho



WIRING P.C.B

PG1507

4	DAMP ⊖
3	DAMP ⊕
2	DRIVE ⊖
1	$\overline{PB}$ 9V

To LENS BLOCK (IRIS MOTOR) CN7

PG1508

1	$\overline{POWER\ CONT.}$
2	GND
3	12V
4	ZOOMING ⊕
5	ZOOMING ⊖

To LENS BLOCK (AUTO FOCUS) CN5

PG1511

1	DISPLAY
2	SHIFT
3	CHARACTER
4	START
5	$\overline{PB}$ 5V
6	AUTO WHT BAL
7	WHT BAL CONT.
8	BACK LIGHT CONT.
9	GND
10	$\overline{REVIEW}$
11	BATTERY
12	GND

To CONTROL CN1511

CN1509

BRN	1	12V
RED	2	$\overline{PB}$ 9V
ORN	3	$\overline{POWER\ CONT.}$
YEL	4	GND

To REGULATOR PG1509

PG1502

10	$\overline{PB}$ 9V
9	DAMP ⊕
8	$\overline{PB}$ 9V
7	DRIVE ⊖
6	——
5	DAMP ⊖
4	GND
3	BACK LIGHT CONT.
2	GND
1	WHT BAL CONT.

To PROCESS (PROCESS) PM1502

PG1503

1	$\overline{C.SYNC}$
2	AUTO WHT BAL
3	$\overline{CHD}$
4	B-YL
5	$\overline{B.BLK}$
6	R-YL
7	CHROMA LEVEL
8	LUMA
9	GND
10	GND
11	GND
12	10.7MHz CLOCK
13	BATTERY
14	H.BF
15	START
16	$\overline{PB}$ 5V

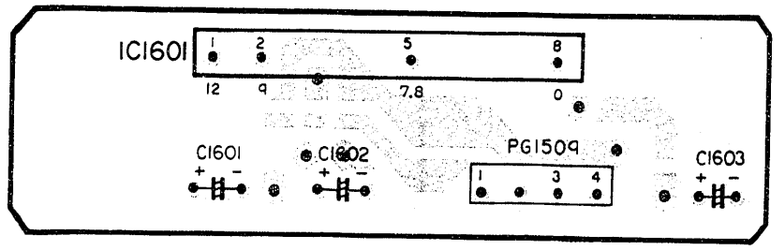
To ENCODER PM1503

PG1504

16	$\overline{PB}$ 9V
15	ZOOMING ⊖
14	$\overline{VTR\ REC\ SW}$
13	ZOOMING ⊕
12	9V
11	12V
10	TIME LAPSE
9	$\overline{POWER\ CONT.}$
8	REC/LOW BATT.
7	GND
6	EVF VIDEO
5	$\overline{PB}$
4	VIDEO
3	CHARACTER
2	SHIFT
1	DISPLAY

To ENCODER PM1504

REGULATOR CIRCUIT BOARD



REGULATOR P.C.B

Soldered Side

Parts Side

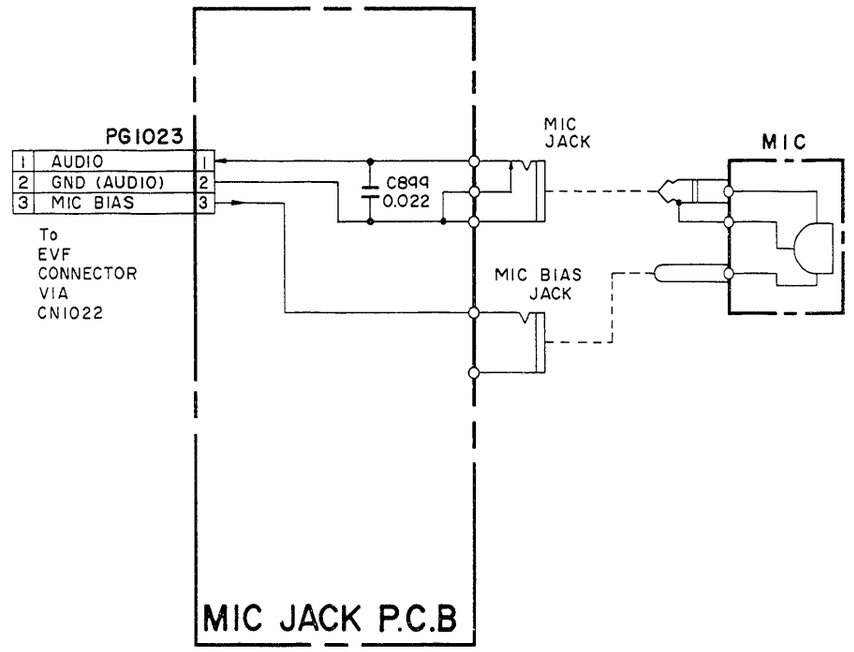
⊙ Through hole

PG1509

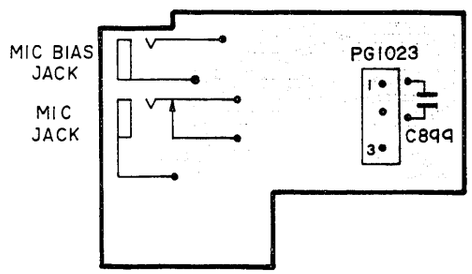
1	12V
2	$\overline{PB}$ 9V
3	$\overline{POWER\ CONT.}$
4	GND

To WIRING CN1509

• MIC JACK SCHEMATIC DIAGRAM



• MIC JACK CIRCUIT BOARD



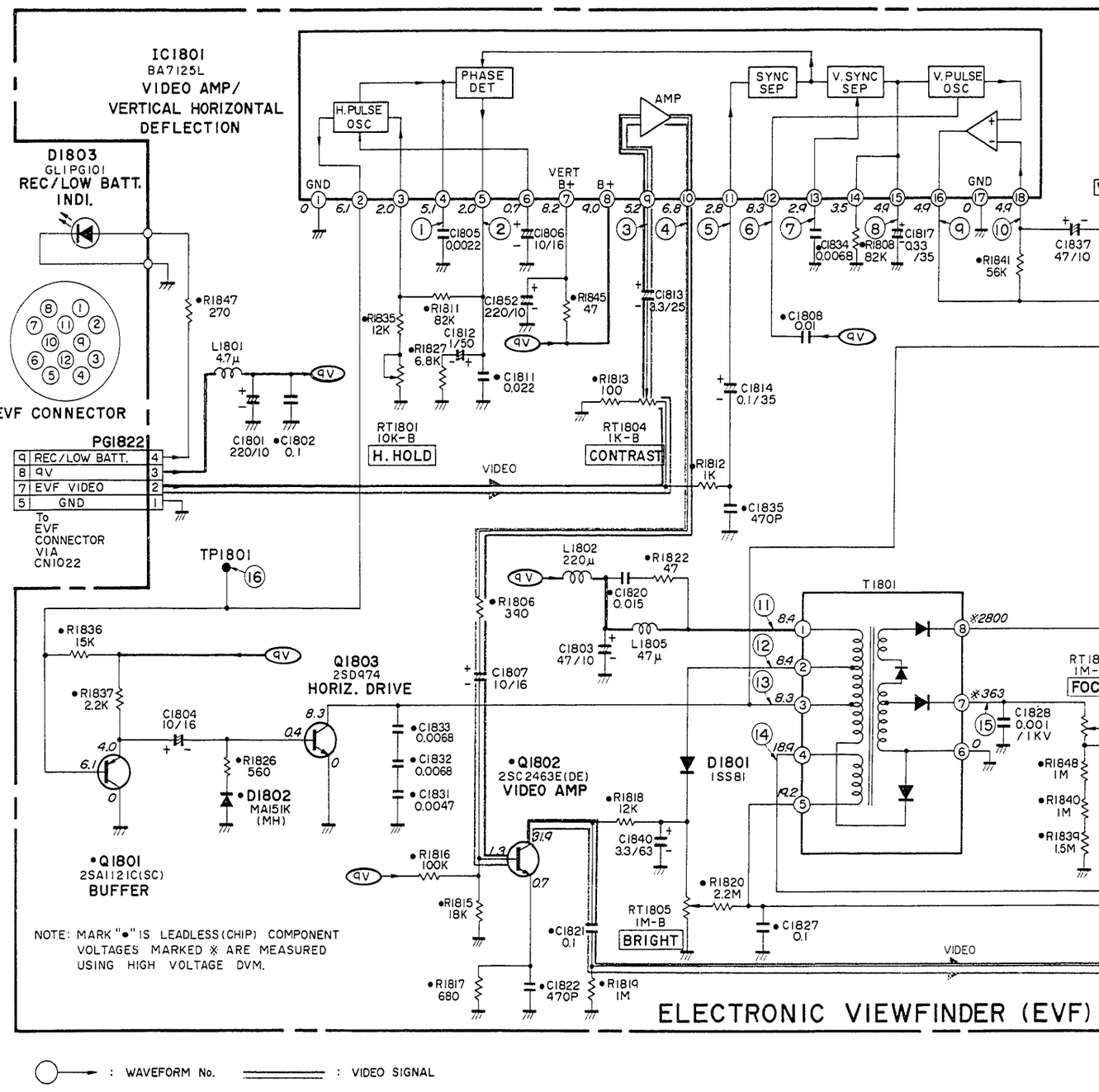
MIC JACK P.C.B

PG1023

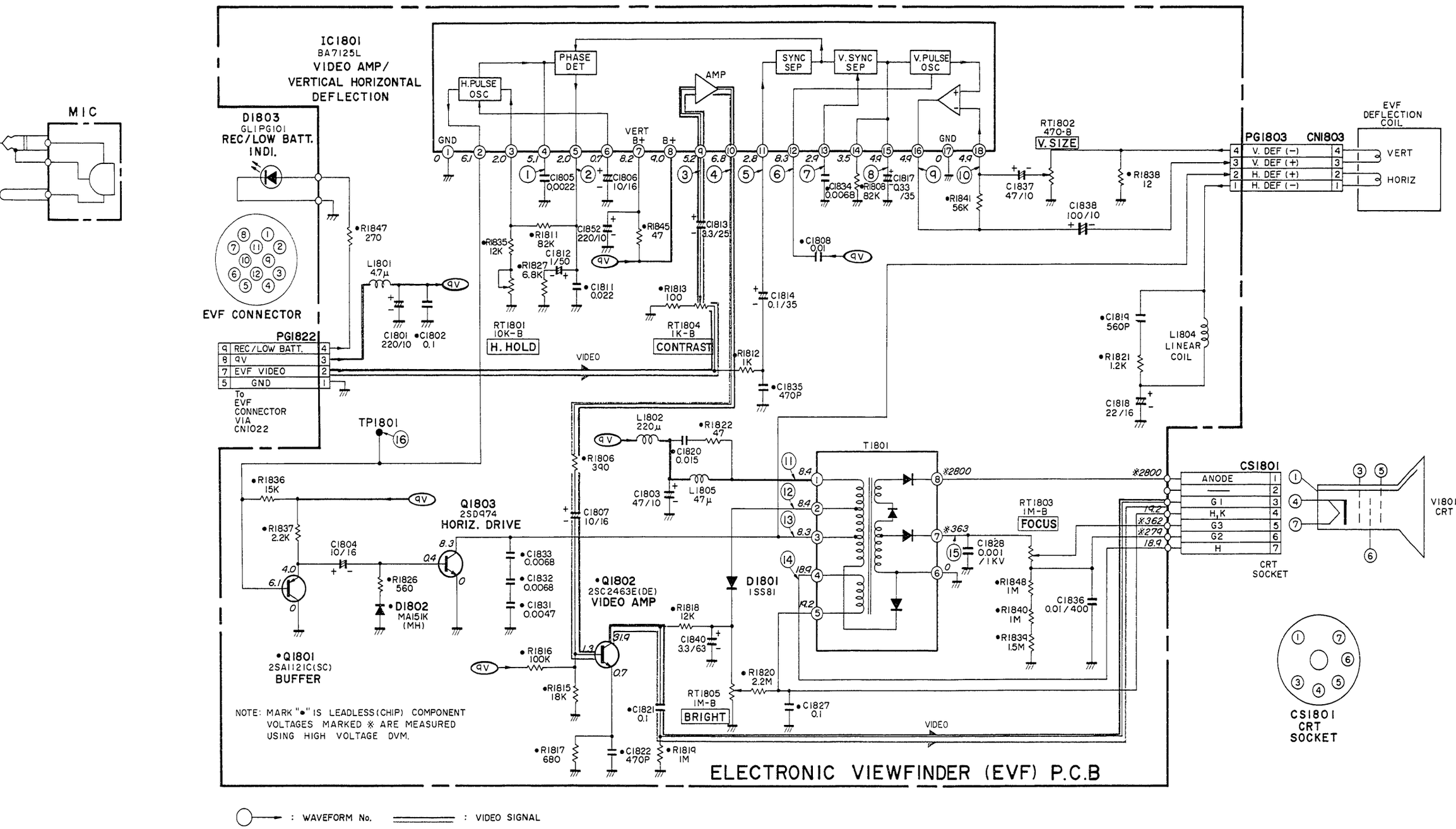
1	AUDIO
2	GND (AUDIO)
3	MIC BIAS

To
EVF
CONNECTOR
VIA
CN1022

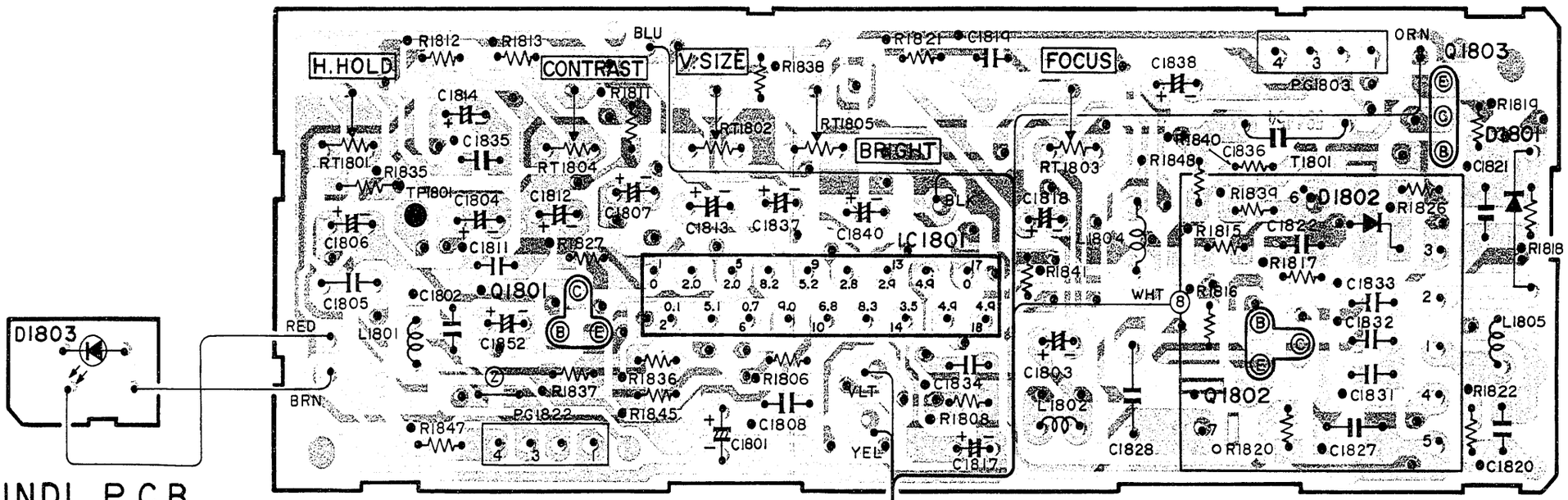
ELECTRONIC VIEWFINDER SCHEMATIC DIAGRAM



ELECTRONIC VIEWFINDER SCHEMATIC DIAGRAM



ELECTRONIC VIEWFINDER CIRCUIT BOARD



INDI. P.C.B

ELECTRONIC VIEWFINDER P.C.B

PG1803

4	V. DEF (−)
3	V. DEF (+)
2	H. DEF (+)
1	H. DEF (−)

To
EVF
DEFLECTION
COIL
CN1803

PG1822

4	REC/LOW BATT.	9
3	9V	8
2	EVF VIDEO	7
1	GND	5

To
EVF
CONNECTOR
VIA
CN1022

CS1801

WHT	1	ANODE
	2	——
ORN	3	G1
YEL	4	H,K
BLK	5	G3
BLU	6	G2
VLT	7	H

To
CRT
SOCKET

Soldered Side

Parts Side

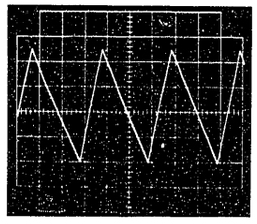
● Through hole

※ NOTE : MARK "Ⓩ" IS LEADLESS JUMPER.
MARK "●" IS LEADLESS (CHIP) COMPONENT.

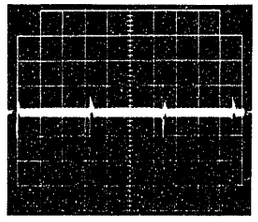
SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL.-/CAPST.-MOTORS DRIVE	130
HEAD SW/LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

ELECTRONIC VIEWFINDER WAVEFORMS

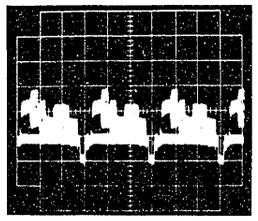
① IC1801-4
0.5V/20 μsec. cm



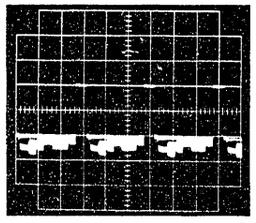
② IC1801-5
0.2V/20 μsec. cm



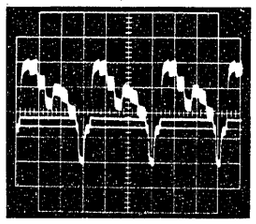
③ IC1801-9
0.1V/20 μsec. cm



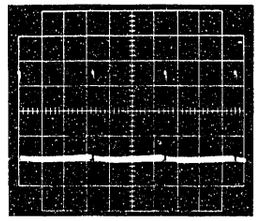
④ IC1801-10
0.5V/20 μsec. cm



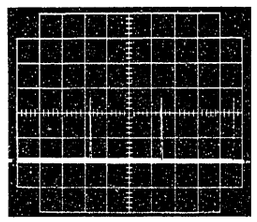
⑤ IC1801-11
0.2V/20 μsec. cm



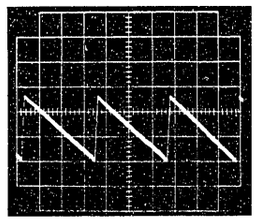
⑥ IC1801-12
0.2V/5m sec. cm



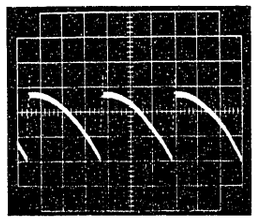
⑦ IC1801-13
1V/5m sec. cm



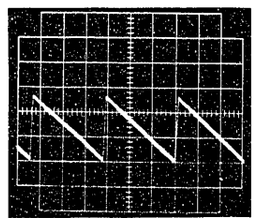
⑧ IC1801-15
0.2V/5m sec. cm



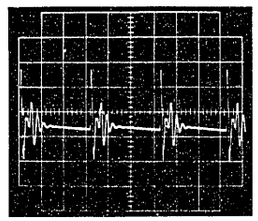
⑨ IC1801-16
2V/5m sec. cm



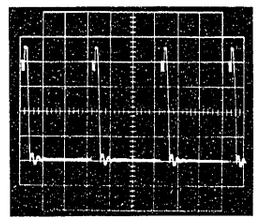
⑩ IC1801-18
0.2V/5m sec. cm



⑪ T1801-1
5V/20 μsec. cm

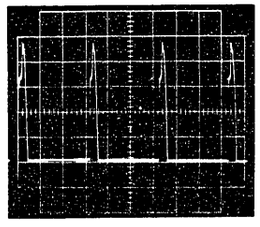


⑫ T1801-2
10V/20 μsec. cm

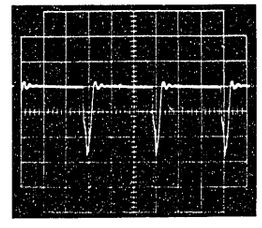


ELECTRONIC VIEWFINDER WAVEFORMS

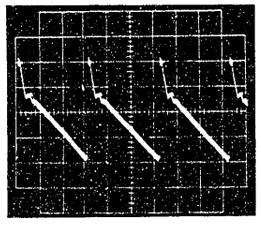
⑬ T1801-3
20V/20 μsec. cm



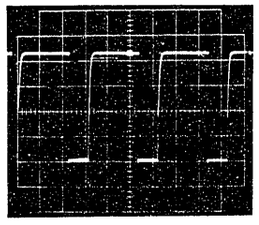
⑭ T1801-4
1V/20 μsec. cm

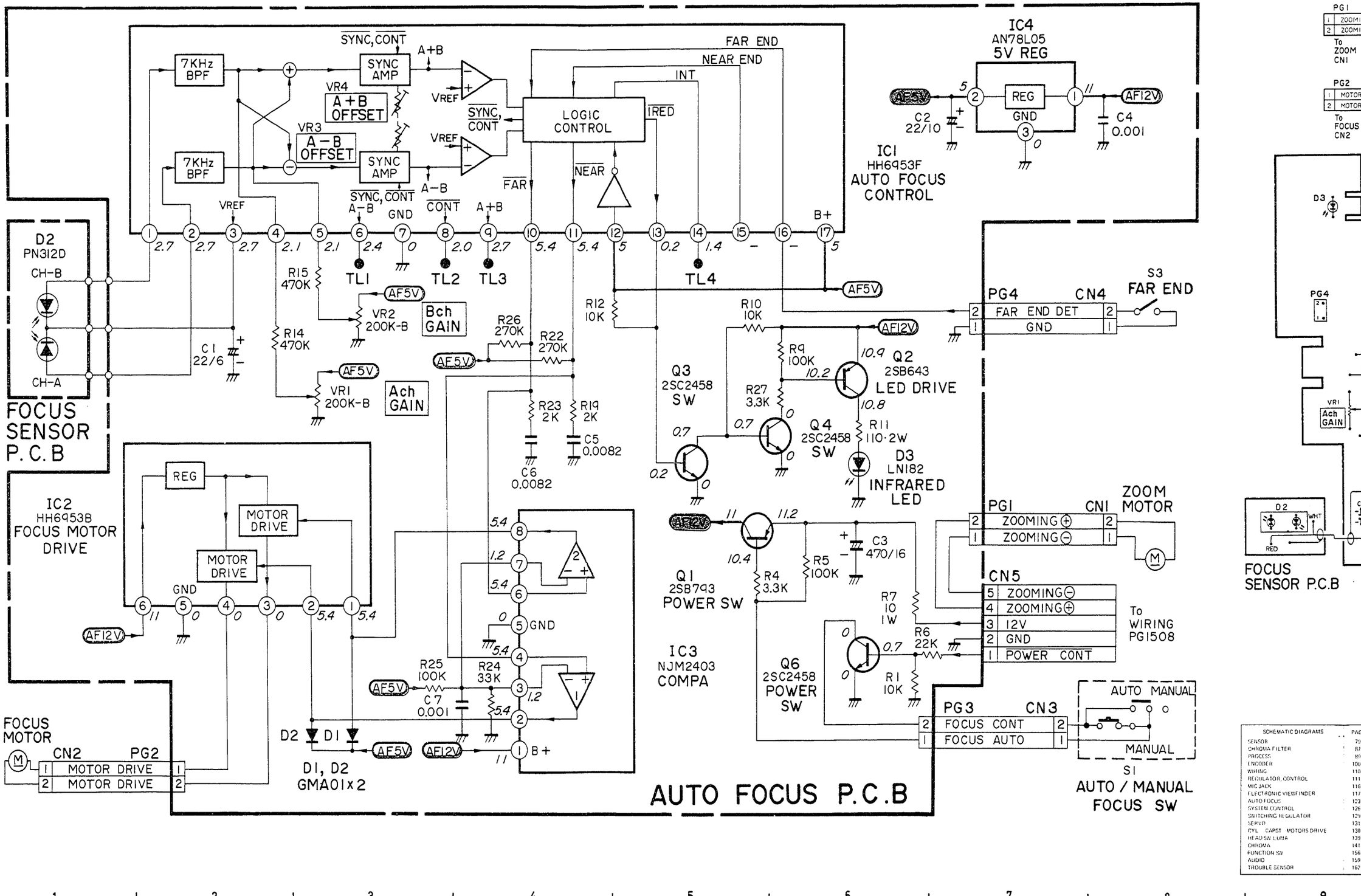


⑮ T1801-7
2V/20 μsec. cm

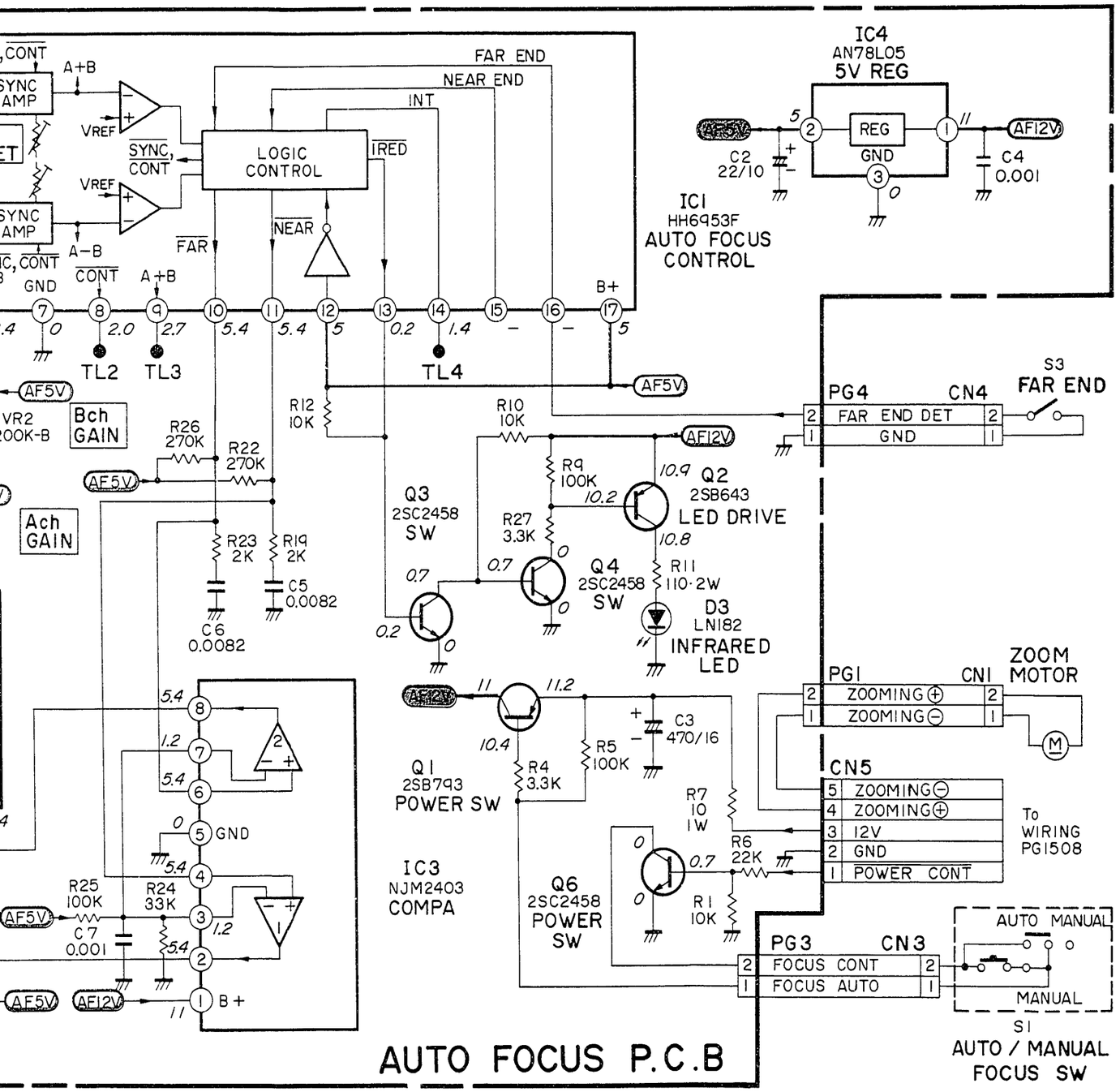


⑯ TP1801
2V/20 μsec. cm

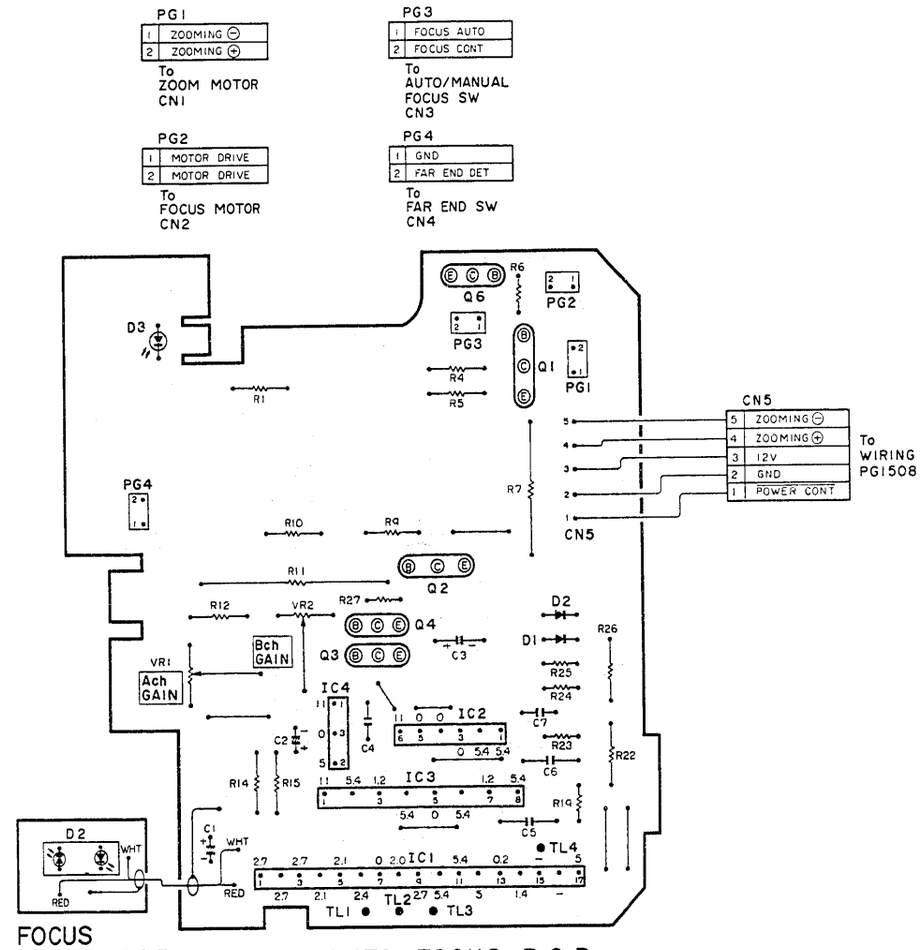




SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL CAPST MOTORS DRIVE	138
HEAD SW LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

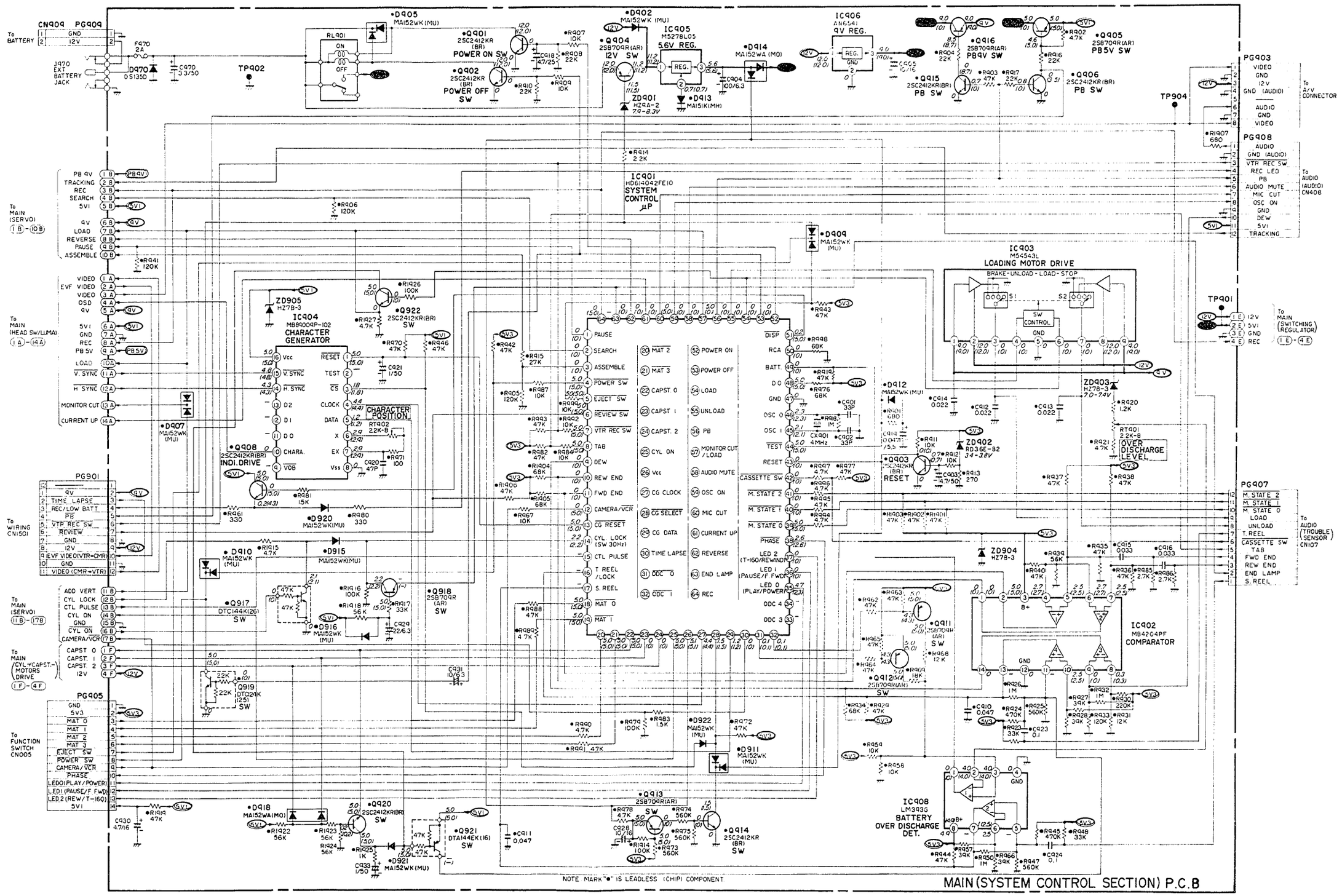


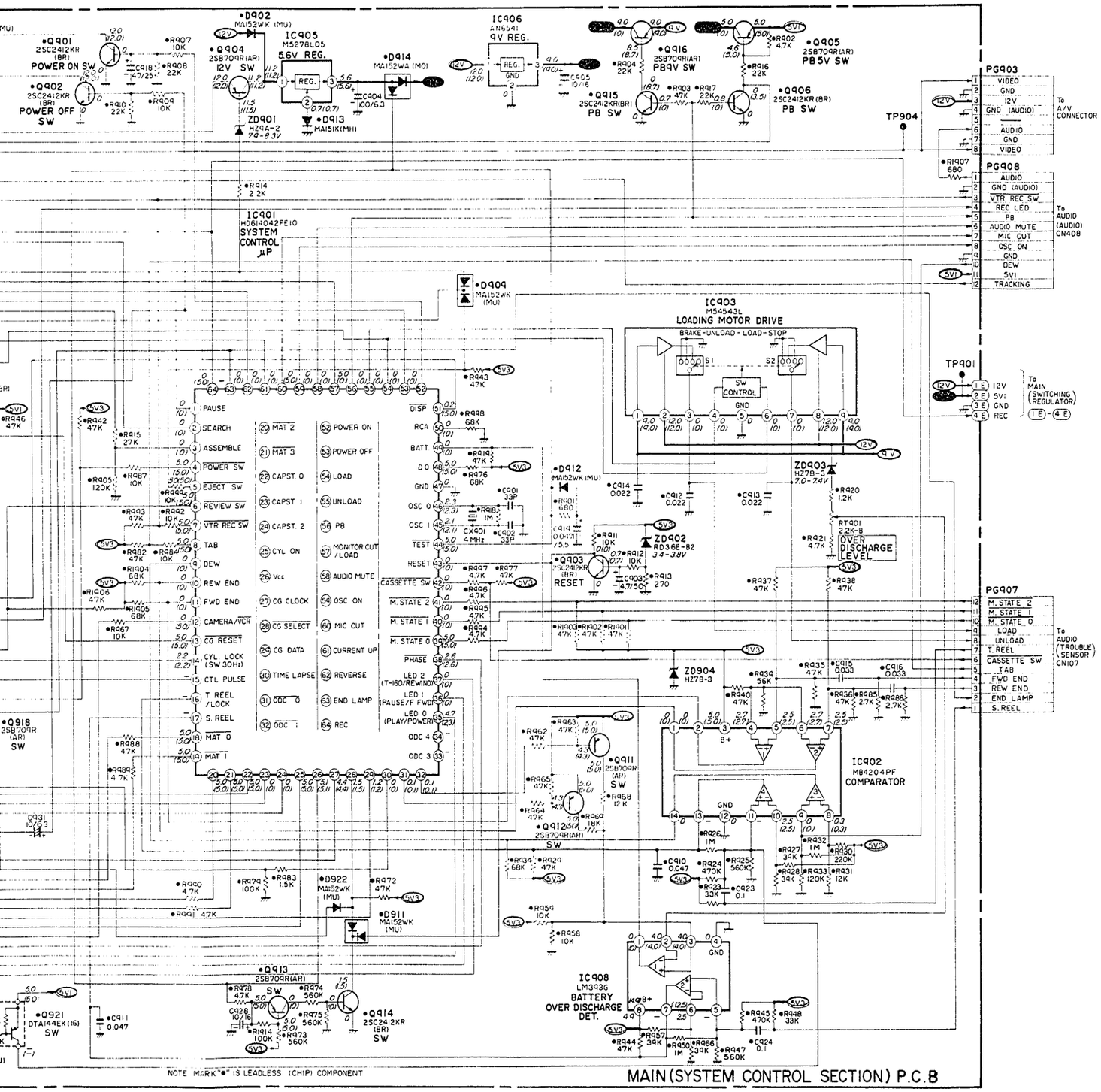
AUTO FOCUS CIRCUIT BOARD



SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL. CAPST. MOTORS DRIVE	136
HEAD SW LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

SYSTEM CONTROL SCHEMATIC DIAGRAM

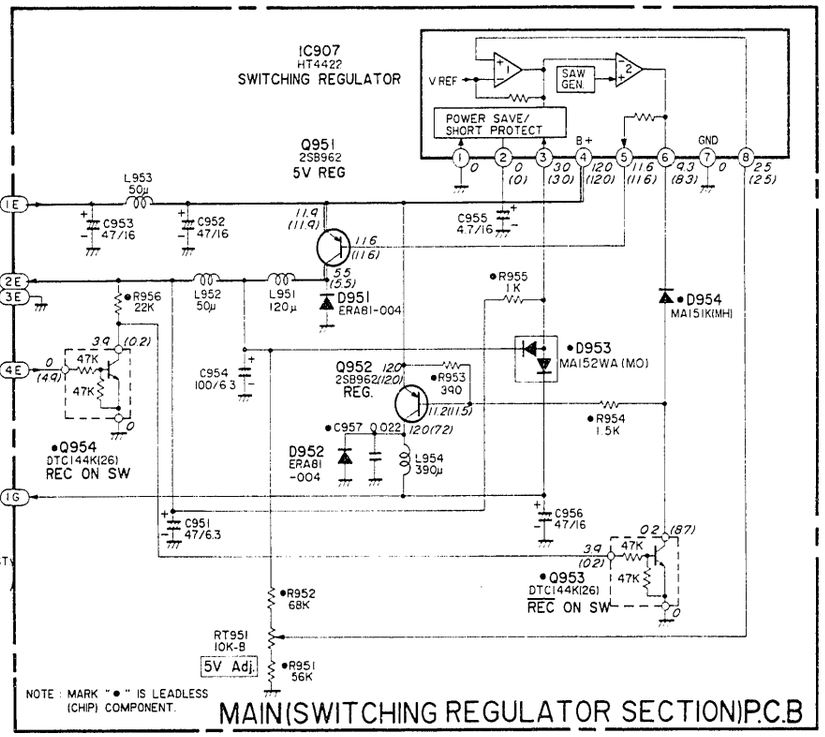




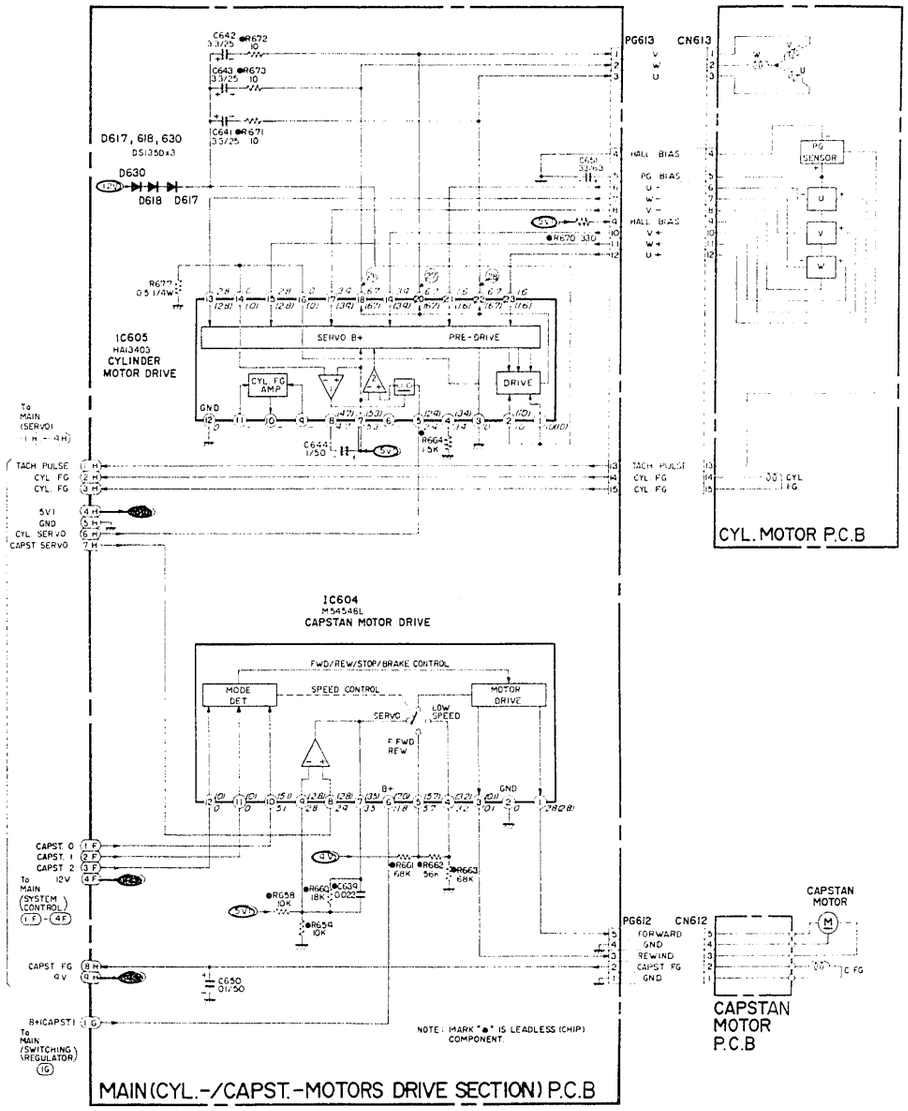
MAIN (SYSTEM CONTROL SECTION) P.C.B

SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL. - CAPST. MOTORS DRIVE	138
HEAD SW, LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	158
TROUBLE SENSOR	162

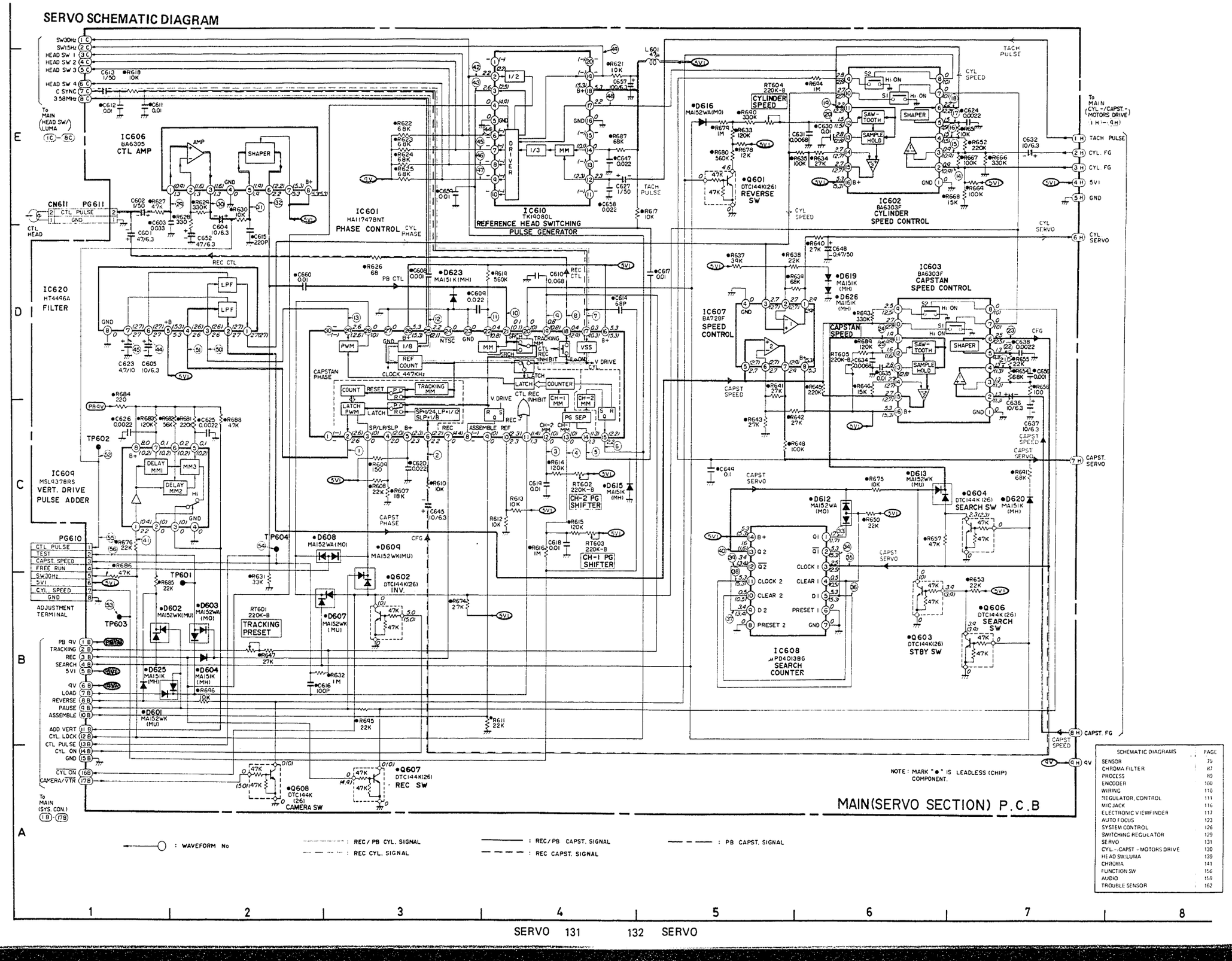
SWITCHING REGULATOR SCHEMATIC DIAGRAM



CYL.–/CAPST.–MOTORS DRIVE SCHEMATIC DIAGRAM



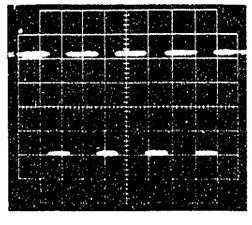
SERVO SCHEMATIC DIAGRAM



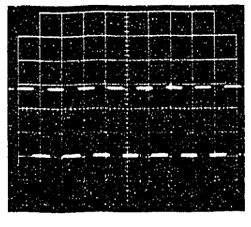
SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL.-/CAPST.-MOTORS DRIVE	130
HEAD SW/LUMA	139
CHROMA	141
FUNCTION SW	150
AUDIO	159
TROUBLE SENSOR	162

SERVO WAVEFORMS

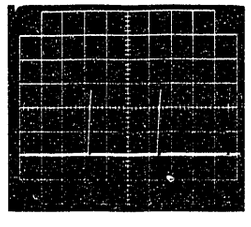
1. IC601-2 REC/PLAY
1V/1msec. cm



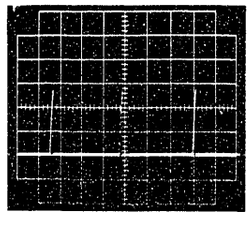
2. IC601-6 REC/PLAY
1V/1msec. cm



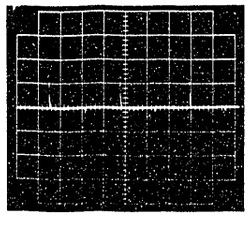
3. IC601-12 REC/PLAY
1V/10msec. cm



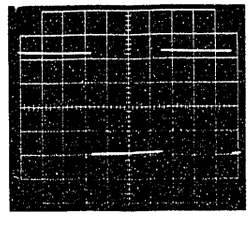
4. IC601-13 REC/PLAY
1V/10msec. cm



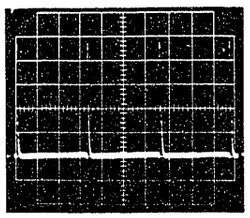
5. IC601-14 REC/PLAY
1V/10msec. cm



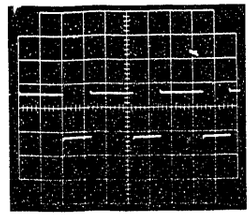
6. IC601-15 REC/PLAY
1V/5msec. cm



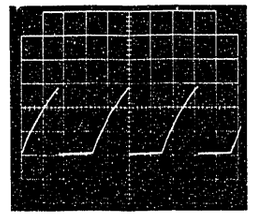
7. IC601-17 REC/PLAY
0.2V/5mse[. cm



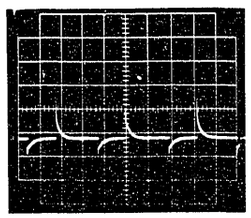
8. IC601-18 REC
2V/10msec. cm



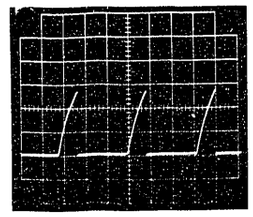
9. IC601-19 REC/PLAY
1V/10msec. cm



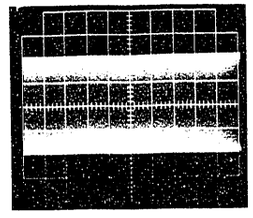
10. IC601-21 REC/PLAY
1V/10msec. cm



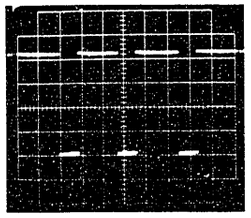
11. IC601-22 REC/PLAY
1V/10msec. cm



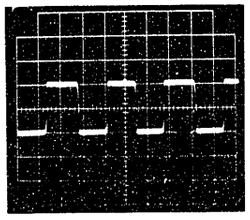
12. IC601-25 REC/PLAY
0.2V/20 μsec. cm



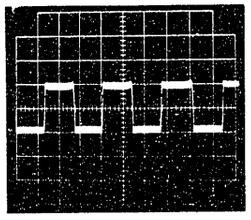
13. IC601-29 REC/PLAY
1V/0.2msec. cm



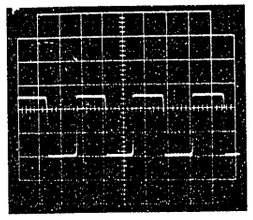
14. IC602-2 REC/PLAY
50mV/1msec. cm



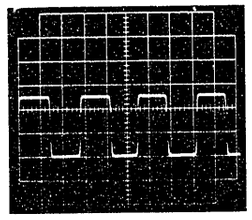
15. IC602-3 REC/PLAY
50mV/1msec. cm



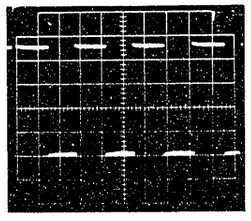
16. IC602-4 REC/PLAY
1V/1msec. cm



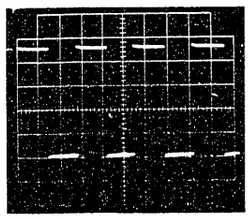
17. IC602-5 REC/PLAY
1V/1msec. cm



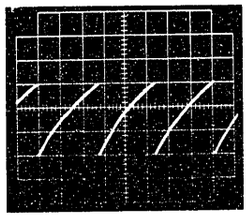
18. IC602-6 REC/PLAY
1V/1msec. cm



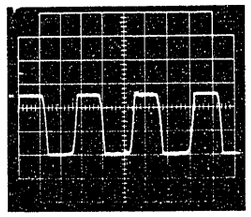
19. IC602-11 REC/PLAY
1V/1msec. cm



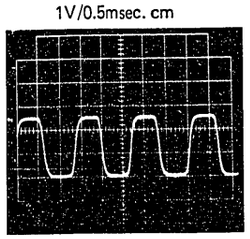
20. IC602-12 REC/PLAY
1V/1msec. cm



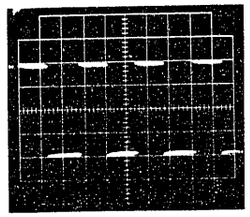
21. IC603-4 REC/PLAY
1V/0.5msec. cm



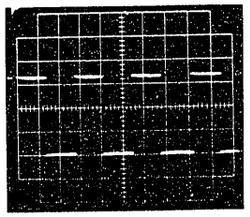
22. IC603-5 REC/PLAY
1V/0.5msec. cm



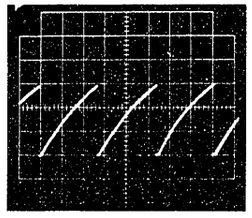
23. IC603-6 REC/PLAY
1V/0.5msec. cm



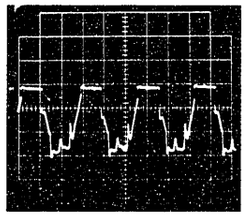
24. IC603-11 REC/PLAY
1V/0.5msec. cm



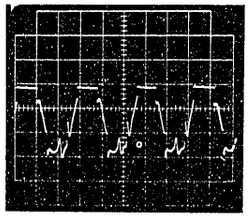
25. IC603-12 REC/PLAY
1V/0.5msec. cm



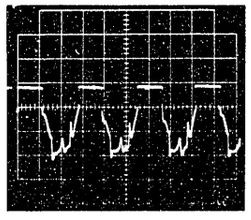
26. IC605-18 REC/PLAY
2V/2msec. cm



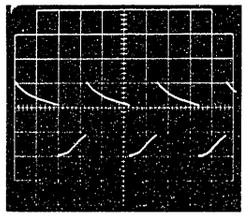
27. IC605-20 REC/PLAY
2V/2msec. cm



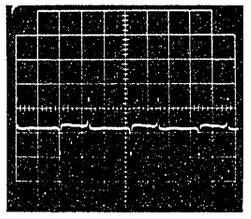
28. IC605-22 REC/PLAY
2V/2msec. cm



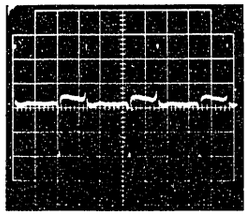
29. IC606-1 REC
1V/10msec. cm



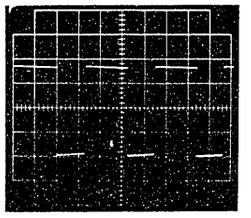
30. IC606-3 PLAY
0.5V/10msec. cm



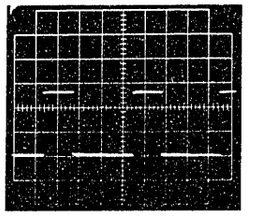
31. IC606-5 PLAY
0.2V/10msec. cm



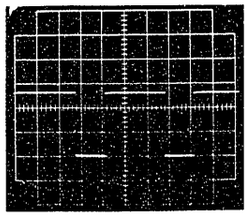
32. IC606-6 PLAY
1V/10msec. cm



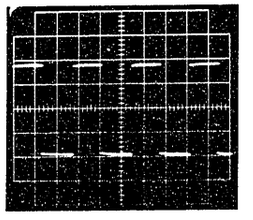
33. IC608-1 REC/PLAY
2V/1msec. cm



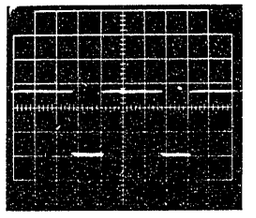
34. IC608-2 REC/PLAY
2V/1msec. cm



35. IC608-3 REC/PLAY
1V/0.5msec. cm

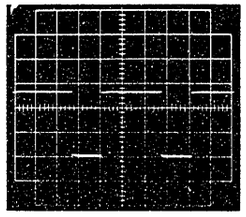


36. IC608-5 REC/PLAY
2V/1msec. cm

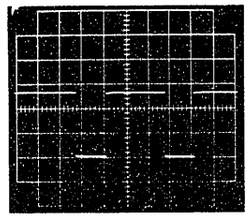


SERVO WAVEFORMS

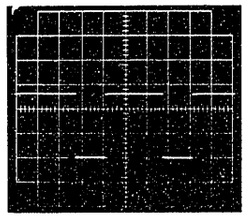
37. IC608-9 REC/PLAY
2V/1msec. cm



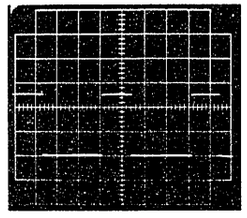
38. IC608-11 REC/PLAY
2V/1msec. cm



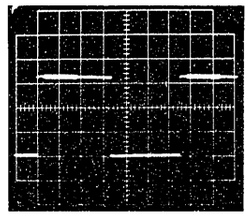
39. IC608-12 REC/PLAY
2V/1msec. cm



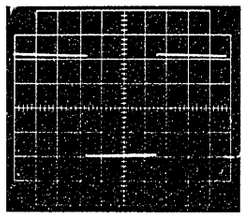
40. IC608-13 REC/PLAY
2V/1msec. cm



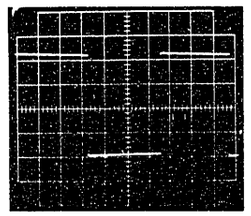
41-A IC609-1 REC
0.2V/5msec. cm



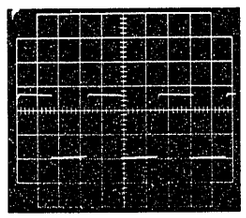
42. IC610-2 REC/PLAY
1V/5msec. cm



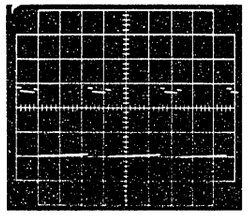
41-B IC609-1 PLAY
1V/5msec. cm



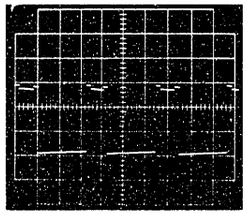
43. IC610-3 REC/PLAY
1V/10msec. cm



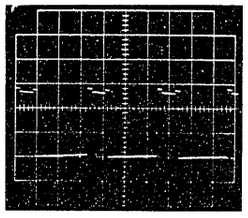
44. IC610-6 REC
2V/20msec. cm



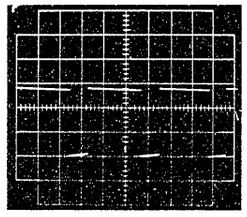
45. IC610-7 REC
2V/20msec. cm



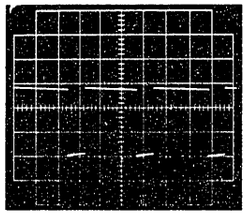
46. IC610-8 REC
2V/20msec. cm



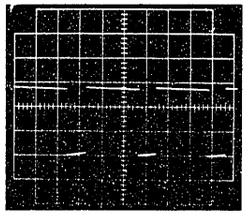
44-B IC610-6 PLAY
2V/20msec. cm



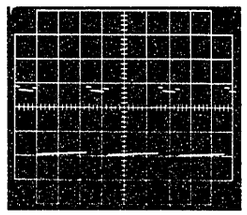
45-B IC610-7 PLAY
2V/20msec. cm



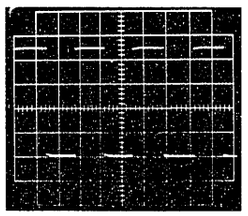
46-B IC610-8 PLAY
2V/20msec. cm



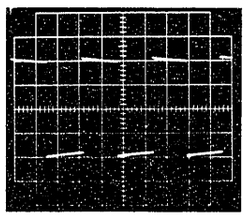
47-A IC610-9 REC
2V/20msec. cm



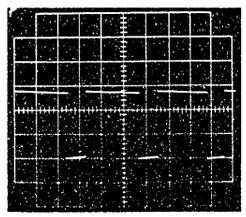
48. IC610-17 REC/PLAY
1V/1msec. cm



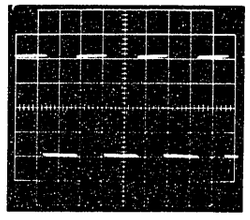
49. IC610-19 REC/PLAY
1V/20msec. cm



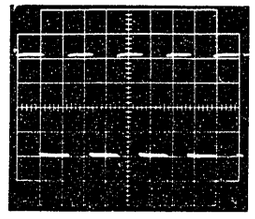
47-B IC610-9 PLAY
2V/20msec. cm



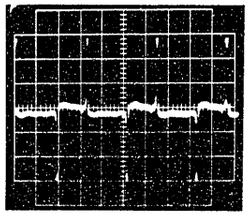
50. IC620-3 REC/PLAY
1V/0.2msec. cm



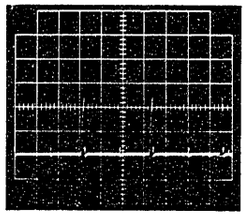
51. IC620-4 REC/PLAY
1V/1msec. cm



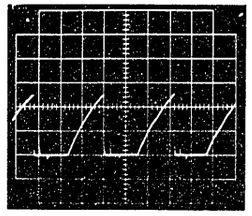
52. TP602 PLAY
0.2V/10msec. cm



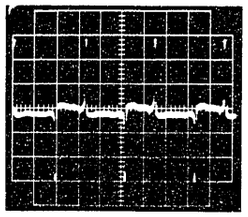
53. TP603 REC/PLAY
1V/10msec. cm



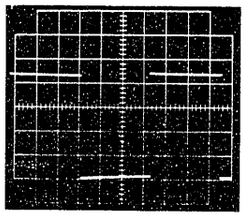
54. TP604 REC/PLAY
1V/10msec. cm



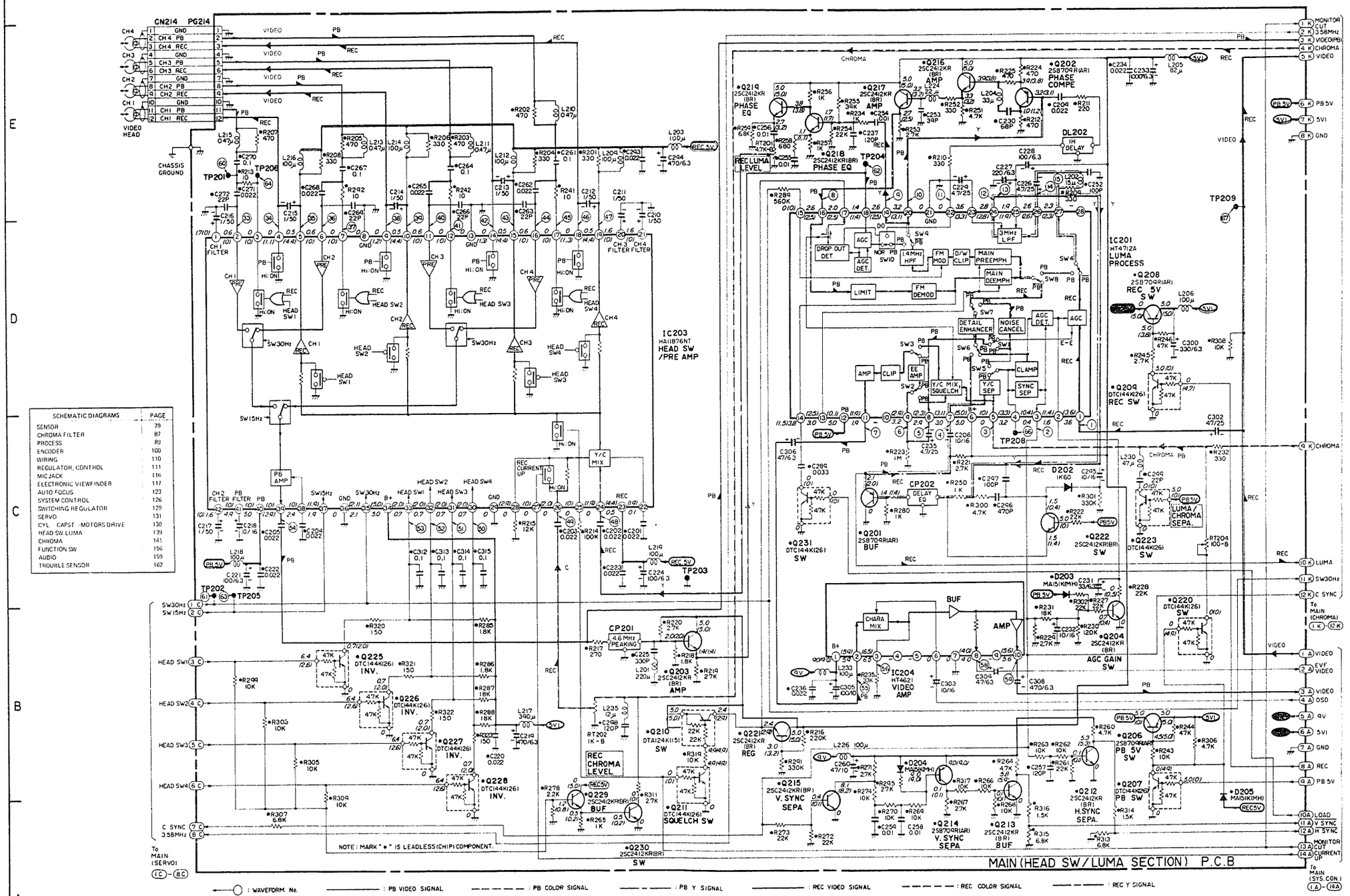
55. PG610-5 REC/PLAY
0.2V/10msec. cm



56. PG610-5 REC/PLAY
1V/5msec. cm

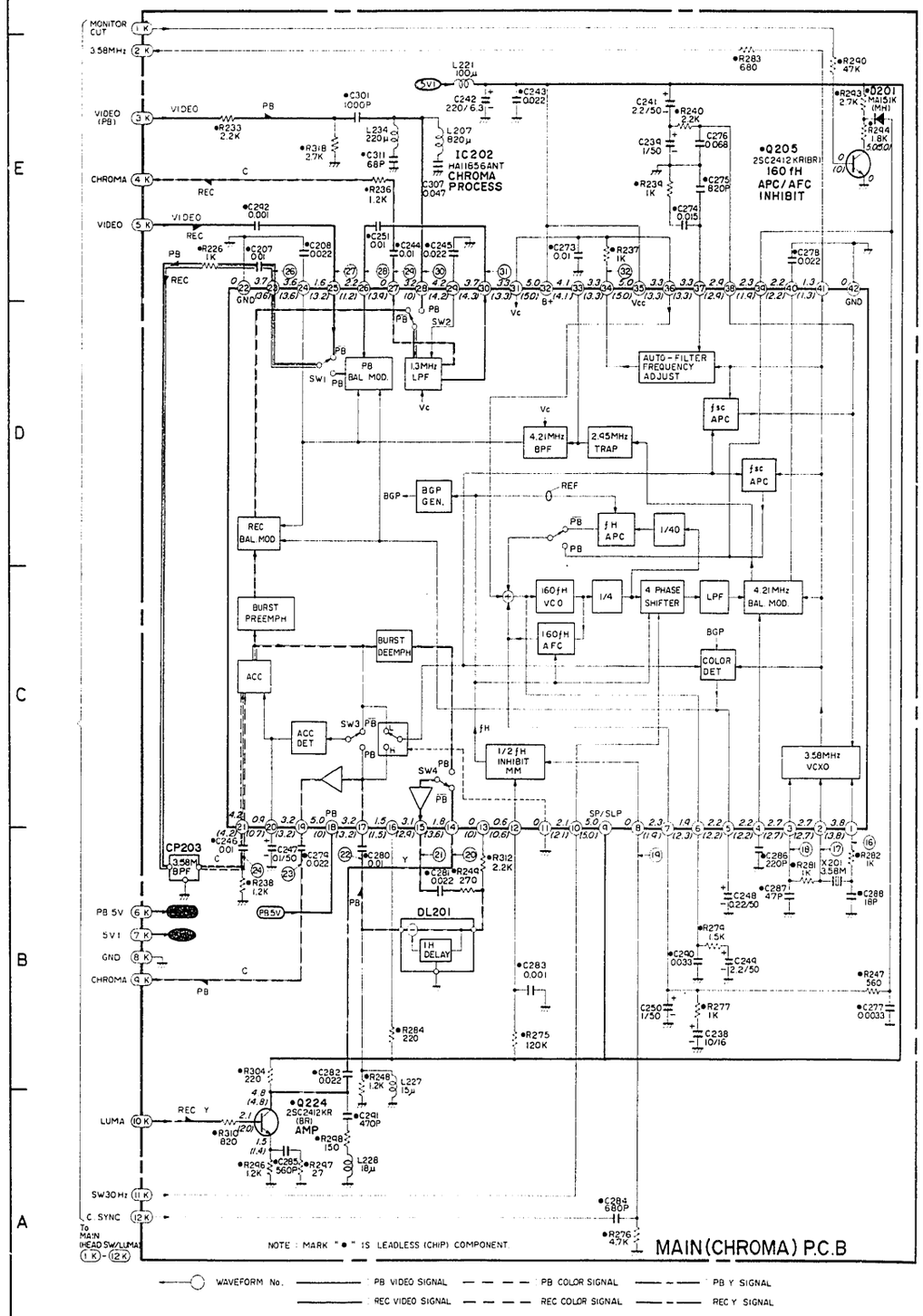


HEAD SW/LUMA SCHEMATIC DIAGRAM



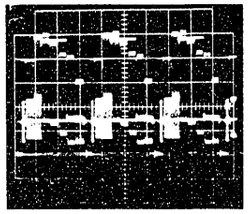
SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL. CAPST. MOTORS DRIVE	130
HEAD SW, LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

CHROMA SCHEMATIC DIAGRAM

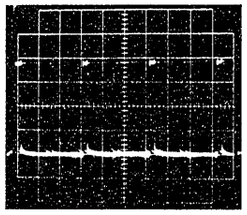


LUMA/CHROMA WAVEFORMS

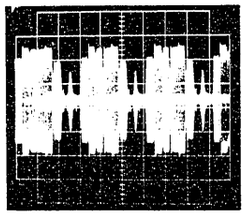
1. IC201-1 REC
0.2V/20 μsec. cm



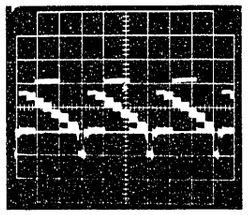
2. IC201-3 REC/PLAY
1V/20 μsec cm



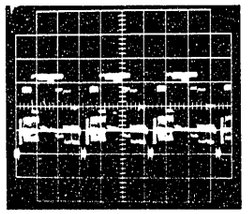
3. IC201-5 PLAY
0.1V/20 μsec. cm



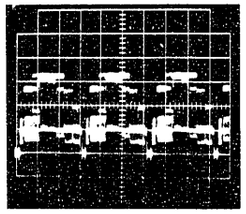
4-A IC201-7
0.1V/20 μsec. cm



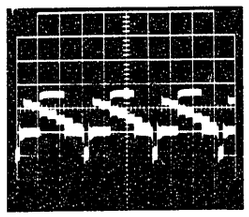
5-A IC201-8 REC
50mV/20 μsec. cm



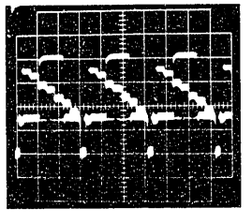
6-A IC201-9 REC
50mV/20 μsec. cm



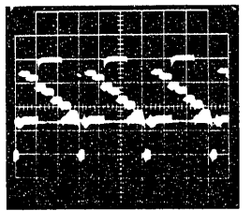
4-B IC201-7 PLAY
0.1V/20 μsec. cm



5-B IC201-8 PLAY
0.2V/20 μsec. cm

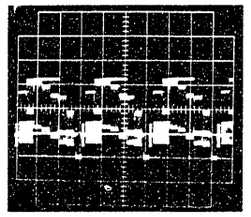


6-B IC201-9 PLAY
0.2V/20 μsec. cm

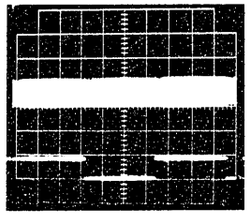


LUMA/CHROMA WAVEFORMS

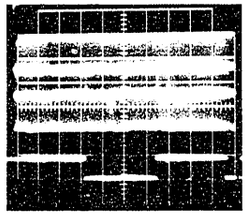
7. IC201-11 REC/PLAY
0.5V/20 μsec. cm



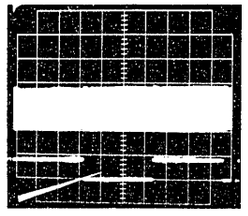
8. IC201-16 PLAY
0.5V/5msec. cm



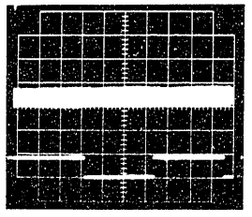
9. IC201-19 REC
0.1V/5msec. cm



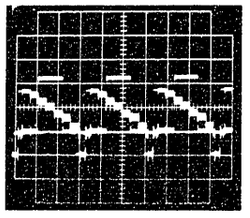
10. IC201-20 PLAY
0.2V/5msec. cm



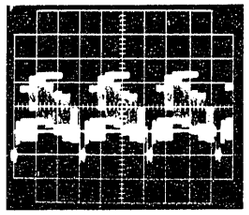
11. IC201-22 PLAY
50mV/5msec. cm



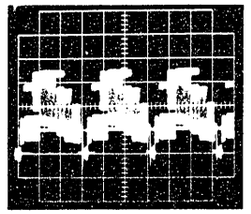
12. IC201-24 REC
0.2V/20 μsec. cm



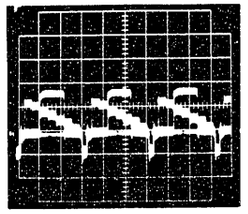
14-A IC201-26 REC
50mV/20 μsec. cm



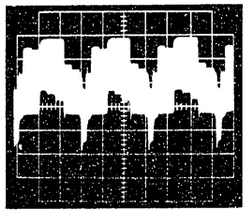
15-A IC201-27 REC
50mV/20 μsec. cm



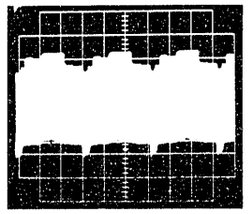
13. IC201-24 PLAY
0.2V/20 μsec. cm



14-B IC201-26 PLAY
50mV/20 μsec. cm

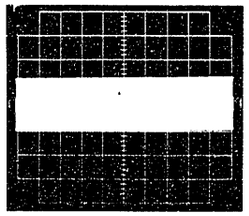


15-B IC201-27 PLAY
0.1V/20 μsec. cm

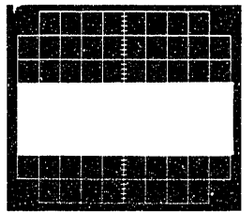


LUMA/CHROMA WAVEFORMS

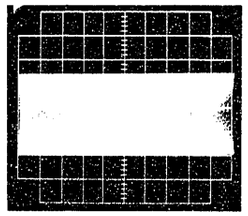
16 IC102-1 REC/PLAY
0.5V/20 μsec. cm



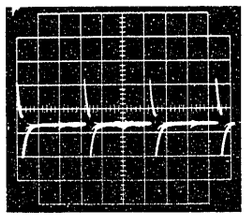
17 IC202-2 REC/PLAY
0.2V/20 μsec. cm



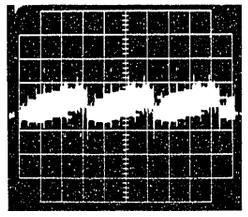
18 IC202-3 REC/PLAY
0.1V/20 μsec. cm



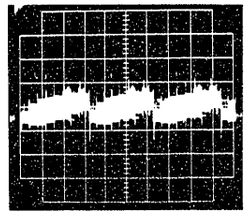
19 IC202-8 REC/PLAY
2V/20 μsec. cm



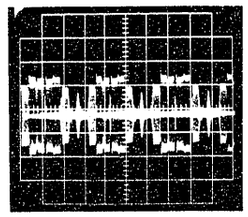
20 IC202-14 REC
50mV/20 μsec. cm



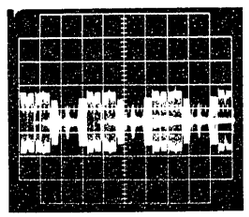
21-A IC202-15 REC
50mV/20 μsec. cm



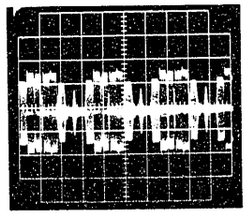
20-B IC202-15 PLAY
0.2V/20 μsec. cm



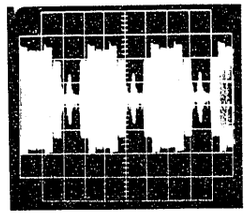
22 IC202-17 PLAY
0.1V/20 μsec. cm



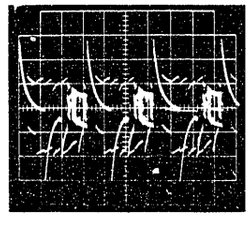
23 IC202-19 PLAY
0.2V/20 μsec. cm



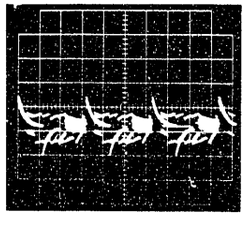
24 IC202-21 REC
50mV/20 μsec. cm



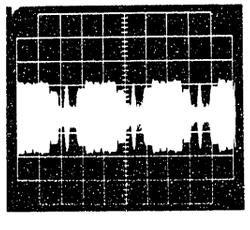
26-A IC202-23 REC
0.2V/20 μsec. cm



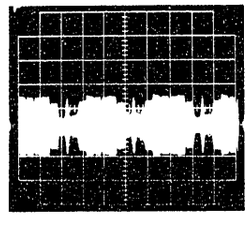
27 IC202-25 REC
0.5V/20 μsec. cm



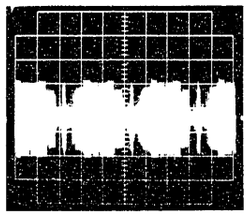
25 IC202-21 PLAY
0.1V/20 μsec. cm



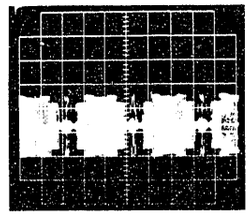
26-B IC202-23 PLAY
0.5V/20 μsec. cm



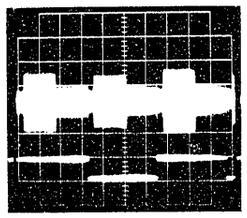
28 IC202-26 PLAY
0.2V/20 μsec. cm



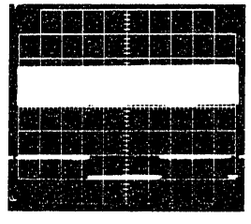
29 IC202-27 REC
0.2V/20 μsec. cm



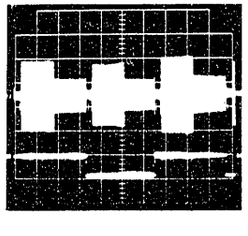
30 IC202-28 PLAY
50mV/5msec. cm



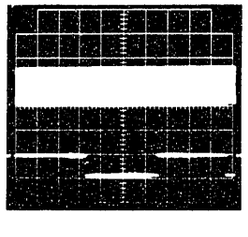
32-A IC202-34 REC
50mV/5msec. cm



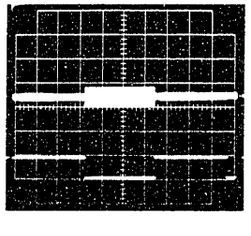
31. IC202-30 PLAY
0.2V/5msec. cm



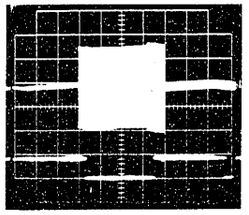
32-B IC202-34 PLAY
50mV/5msec. cm



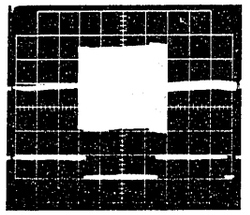
33. IC203-2 PLAY
50mV/5msec. cm



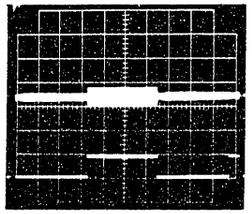
34. IC203-4 REC
1V/5msec. cm



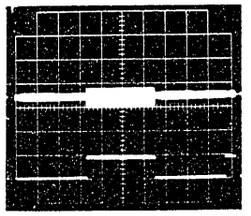
35. IC203-5 REC
1V/5msec. cm



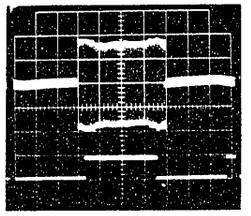
36. IC203-6 PLAY
50mV/5msec. cm



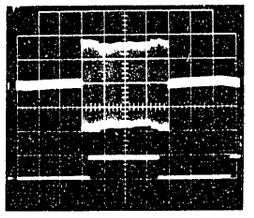
37. IC203-7 PLAY
50mV/5msec. cm



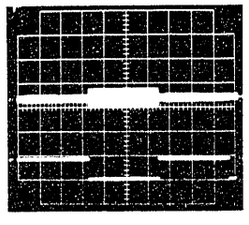
38. IC203-9 REC
1V/5msec. cm



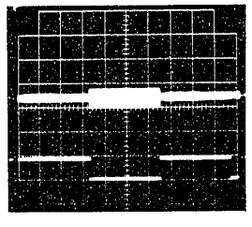
39. IC203-10 REC
1V/5msec. cm



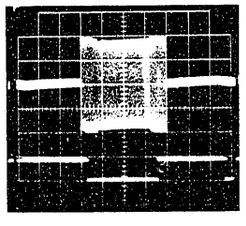
40. IC203-11 PLAY
50mV/5msec. cm



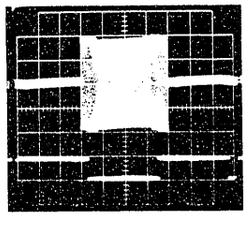
41. IC203-12 PLAY
50mV/5msec. cm



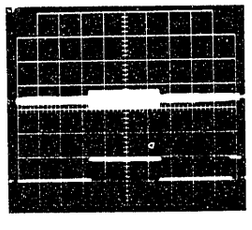
42. IC203-14 REC
1V/5msec. cm



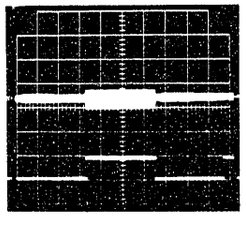
43. IC203-15 REC
1V/5msec. cm



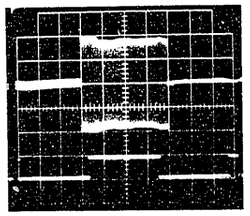
44. IC203-16 PLAY
50mV/5msec. cm



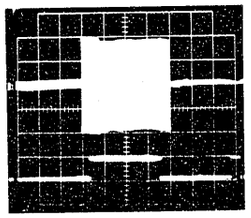
45. IC203-17 PLAY
50mV/5msec. cm



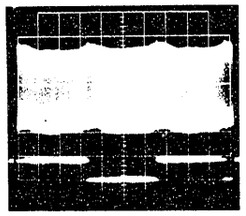
46. IC203-18 REC
1V/5msec. cm



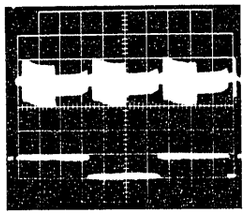
47. IC203-19 REC
1V/5msec. cm



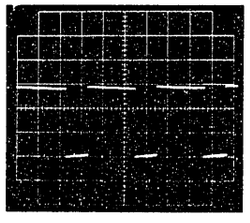
48. IC203-24 PLAY
50mV/5msec. cm



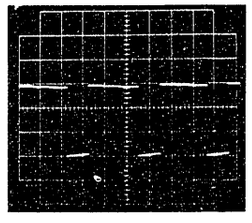
49. IC203-26 REC
50mV/5msec. cm



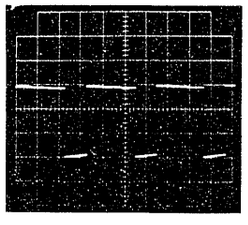
50-A IC203-20 REC
1V/20msec. cm



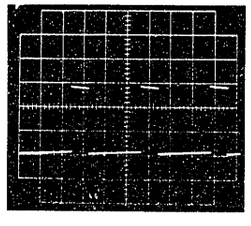
51-A IC203-31 REC
1V/20msec. cm



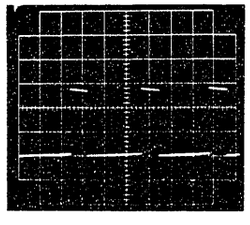
52-A IC203-32 REC
1V/20msec. cm



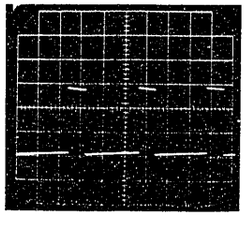
50-B IC203-30 PLAY
1V/20msec. cm



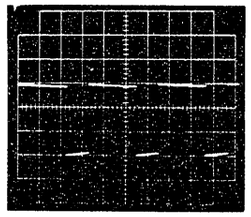
51-B IC203-31 PLAY
1V/20msec. cm



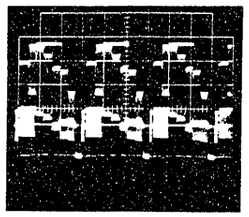
52-B IC203-32 PLAY
1V/20msec. cm



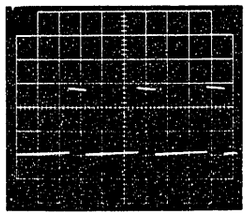
53-A IC203-33 REC
1V/20msec. cm



55. IC204-2 REC/PLAY
0.5V/20 μsec. cm

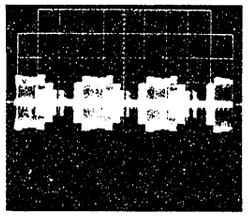


53-B IC203-33 PLAY
1V/20msec. cm

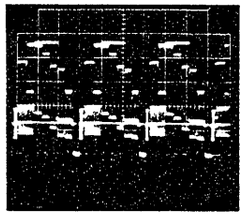


54. IC203-39 PLAY
0.2V/5msec. cm

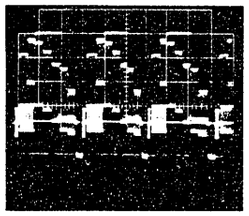
56. IC204-3 REC/PLAY
0.5V/20 μsec. cm



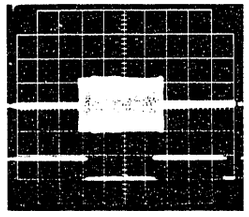
58. IC204-7 REC/PLAY
0.2V/20 μsec. cm



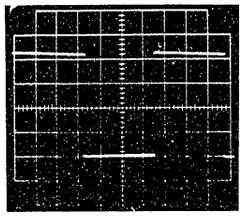
59. IC204-8 REC/PLAY
0.5V/20 μsec. cm



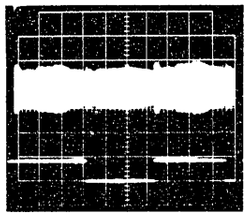
60. TP201 REC
0.1V/5msec. cm



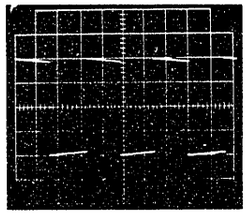
61. TP202 REC/PLAY
1V/5msec. cm



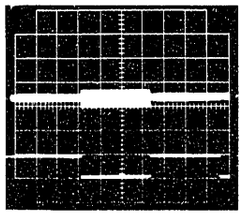
62. TP204 PLAY
0.1V/5msec. cm



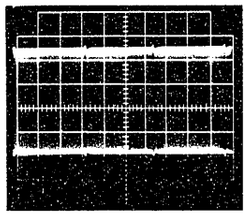
63. TP205 REC/PLAY
1V/20msec. cm



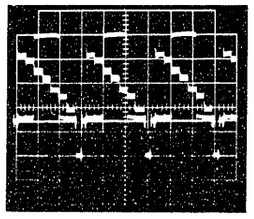
64. TP206 PLAY
50mV/20msec. cm



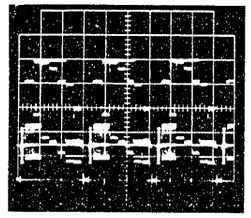
65. TP207 REC/PLAY
0.2V/5msec. cm



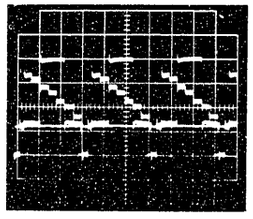
66-A TP208 REC
0.2V/20 μsec. cm



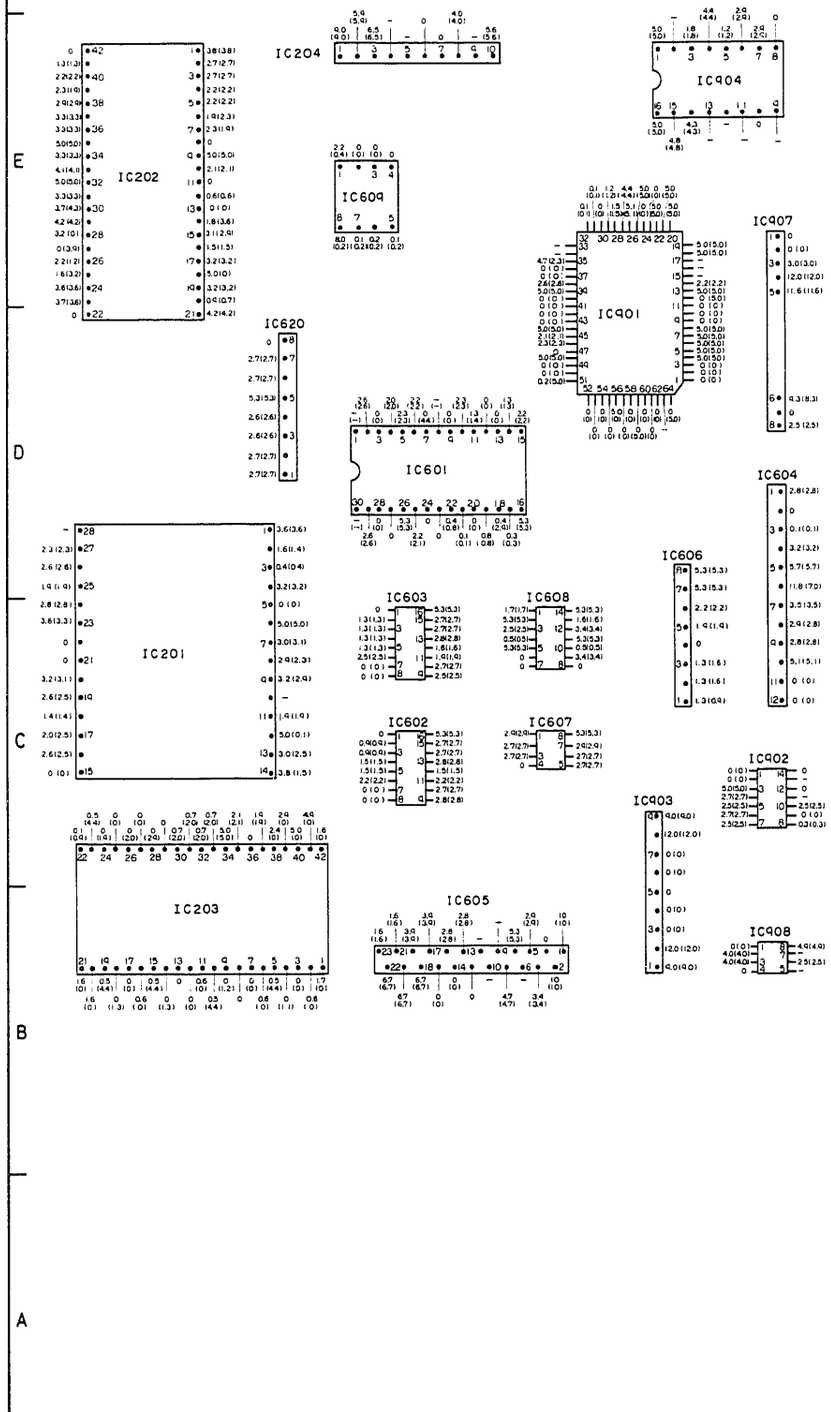
67. TP209 REC
0.2V/20 μsec. cm

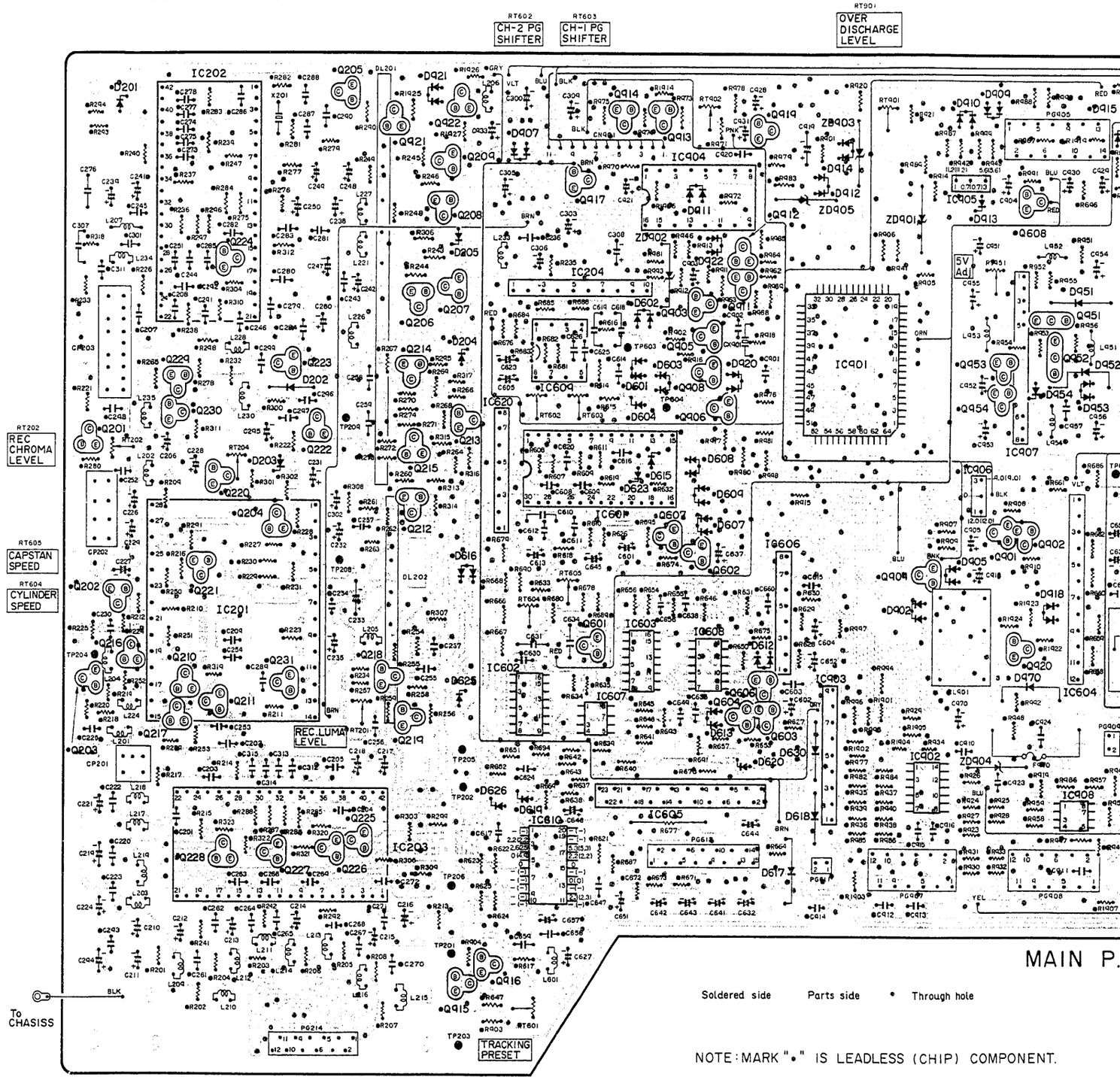


66-B TP208 PLAY
0.2V/20 μsec. cm



MAIN (SYSTEM CONTROL · SWITCHING REGULATOR · SERVO · CYL.–/CAPST.– MOTORS DRIVER · SW/LUMA · CHROMA) CIRCUIT BOARD

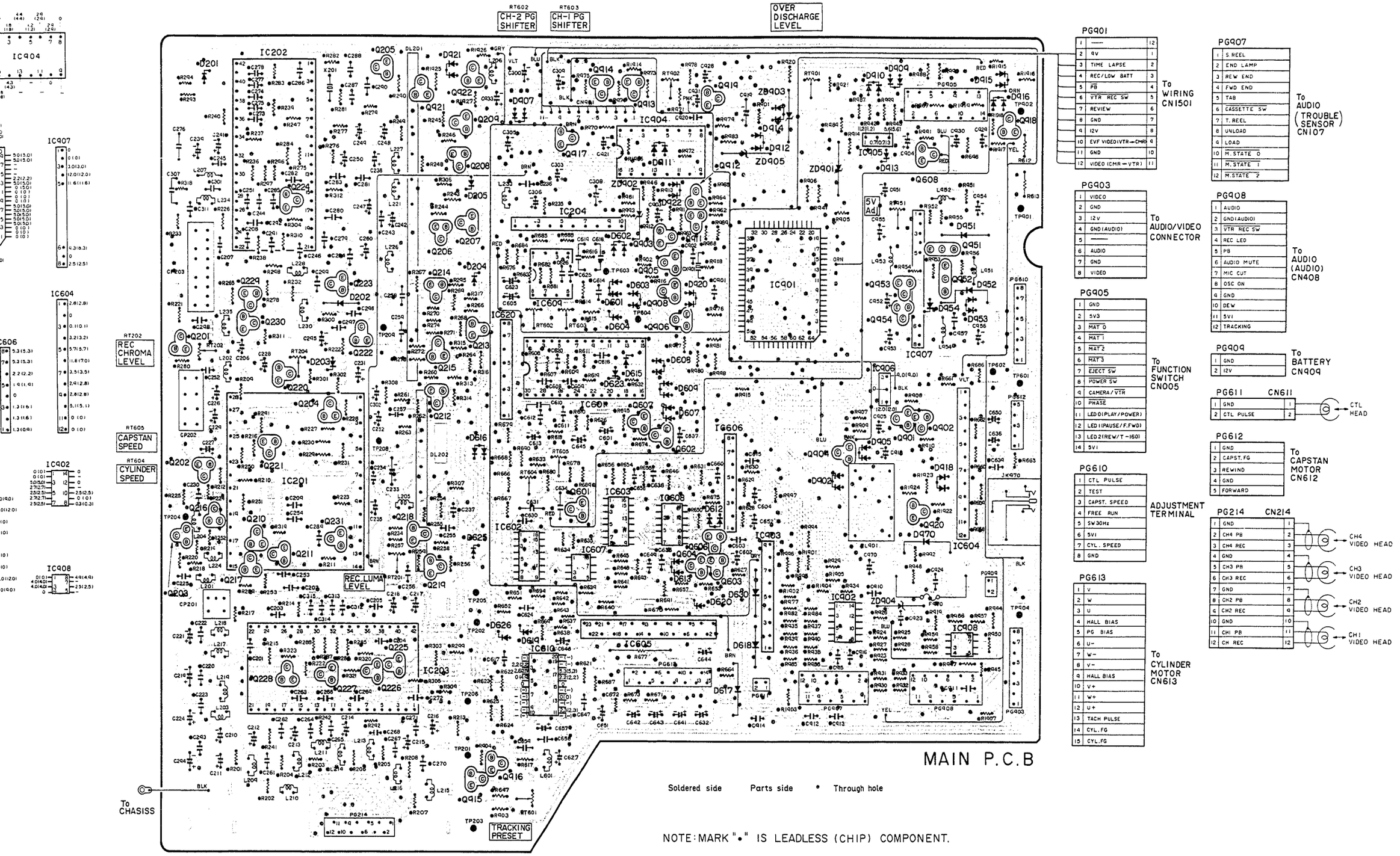




Soldered side Parts side • Through hole

NOTE: MARK "•" IS LEADLESS (CHIP) COMPONENT.

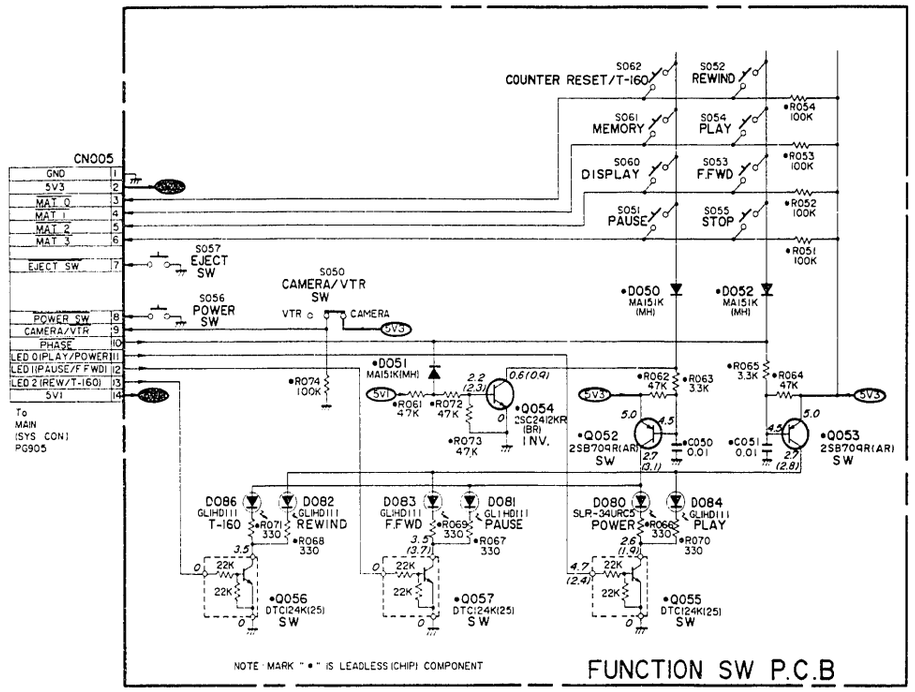
CYL.–/CAPST.– MOTORS DRIVER · SW/LUMA · CHROMA) CIRCUIT BOARD



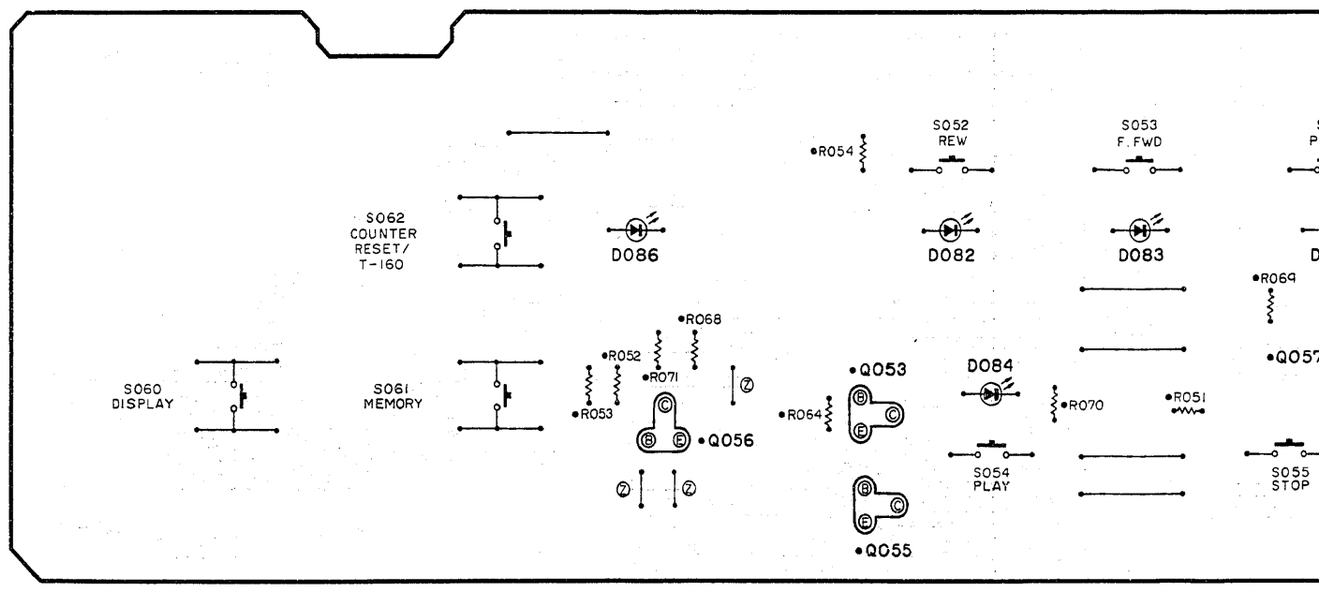
4 5 6 7 8 9 10 11 12

MAIN 153 154 MAIN MAIN 155

FUNCTION SW SCHEMATIC DIAGRAM



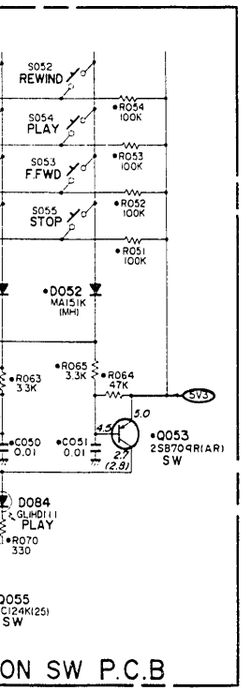
FUNCTION SW CIRCUIT BOARD



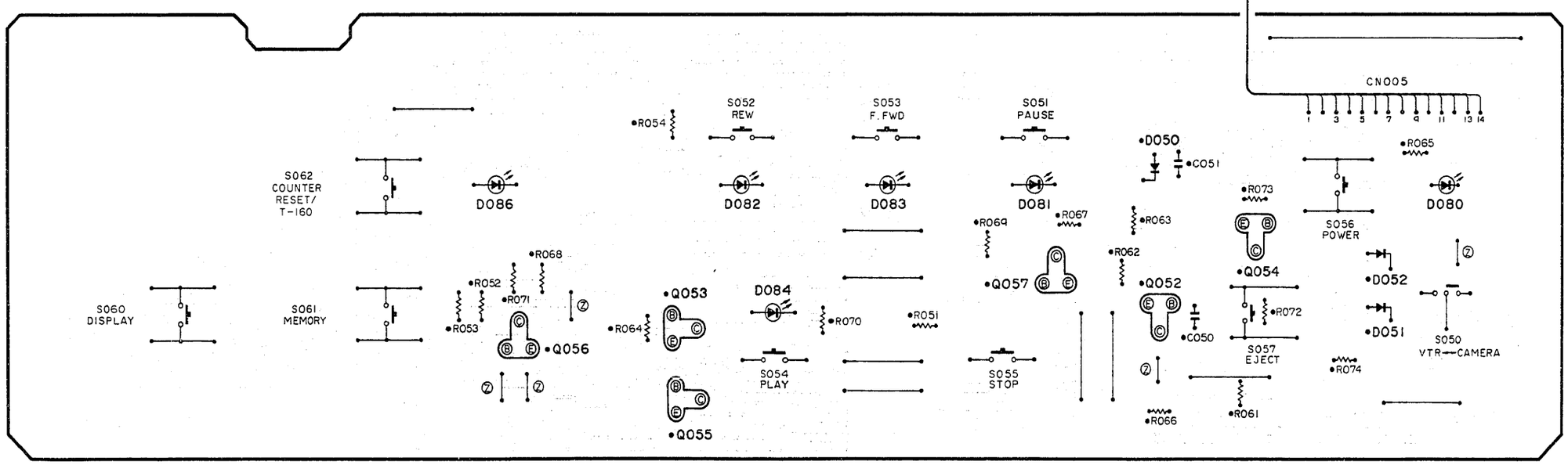
※ NOTE : MARK "Ⓩ" IS LEADLESS JUMPER .
MARK " • " IS LEADLESS(CHIP) COMPONENT .

SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL.-/CAPST.-MOTORS DRIVE	138
HEAD SW/LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

FUNCTION SW CIRCUIT BOARD



FUNCTION SW CIRCUIT BOARD



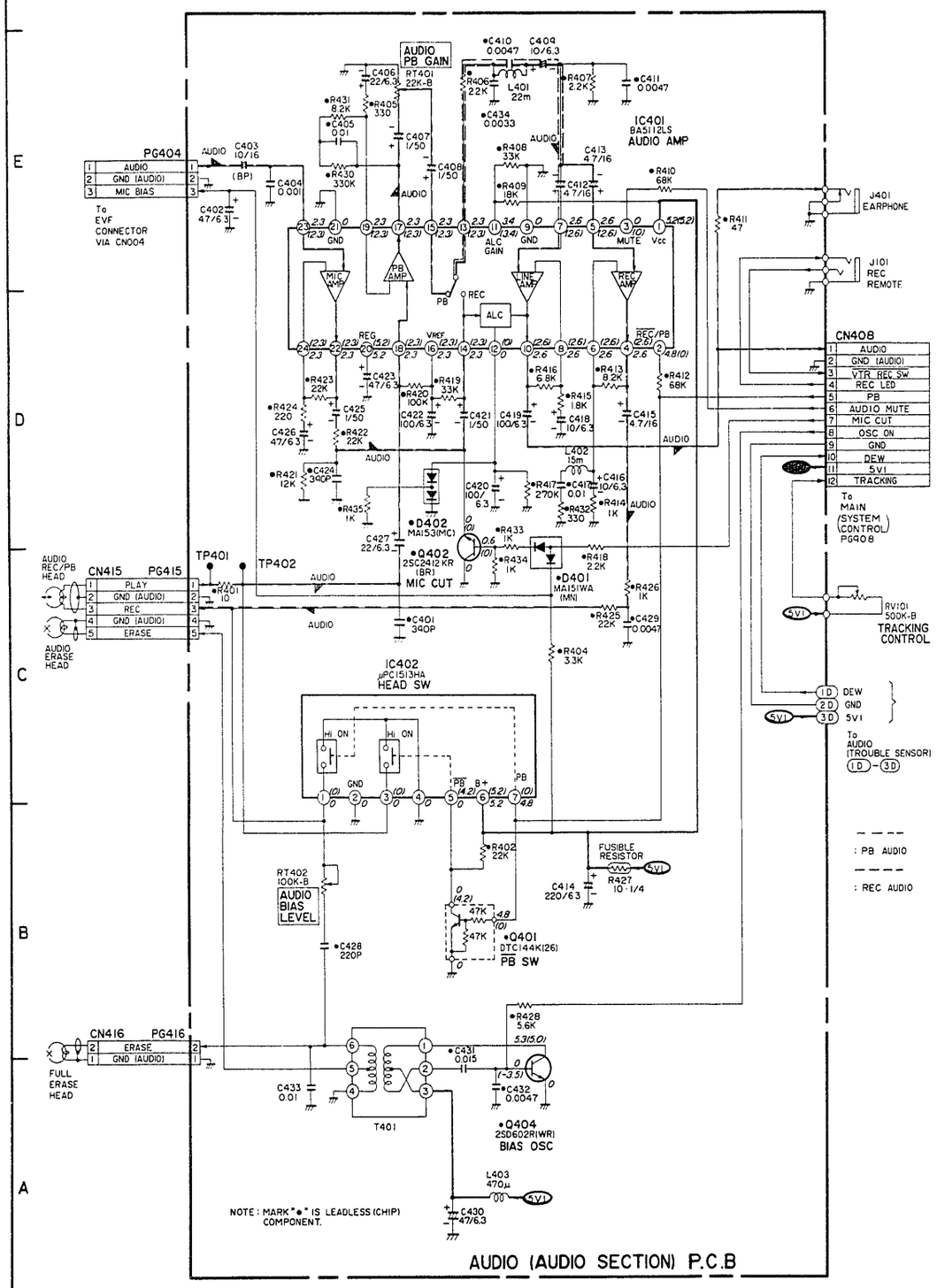
※ NOTE : MARK "Ⓩ" IS LEADLESS JUMPER.
MARK " • " IS LEADLESS(CHIP) COMPONENT.

FUNCTION SW P.C.B

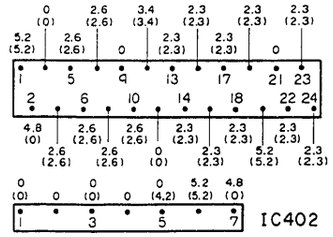
SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR, CONTROL	111
MIC JACK	116
ELECTRONIC VIEWFINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL · CAPST · MOTORS DRIVE	138
HEAD SW/LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

4 5 6 7 8 9 10 11 12

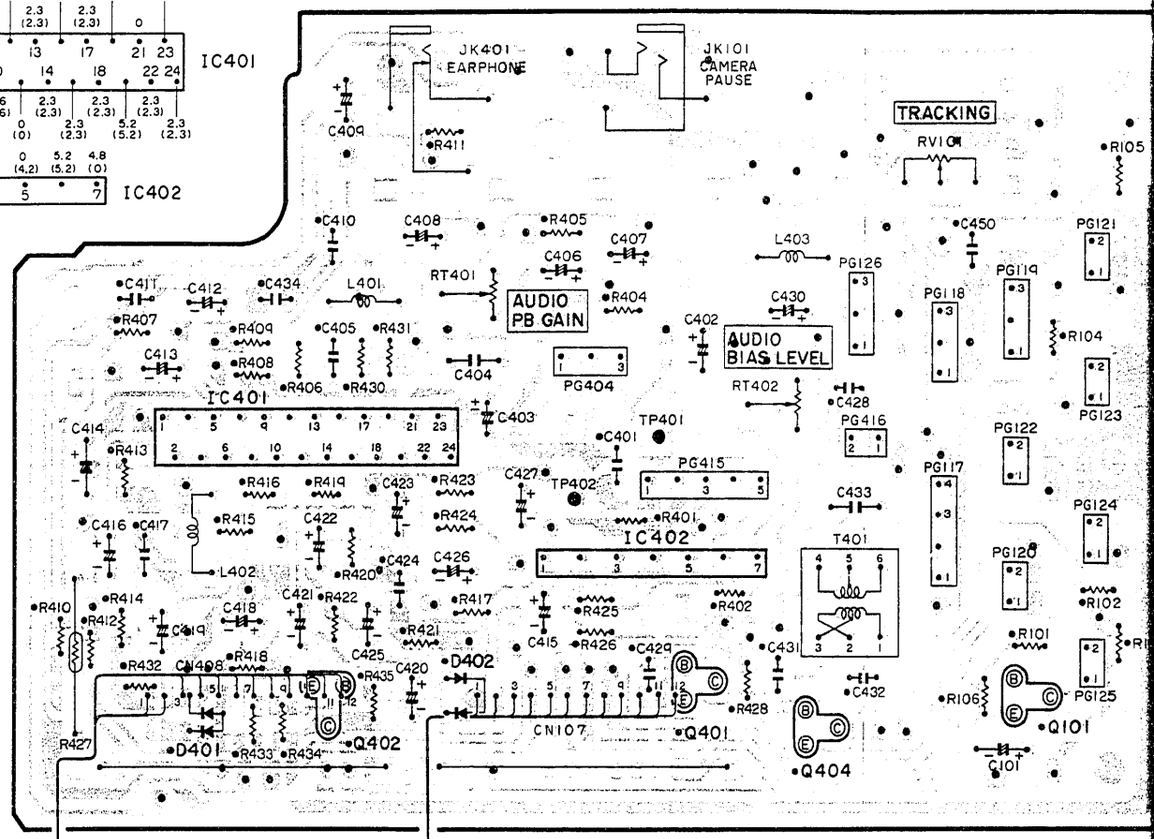
AUDIO SCHEMATIC DIAGRAM



AUDIO CIRCUIT BOARD



AUDIO CIRCUIT BOARD



AUDIO P.C.B

CN408

1	AUDIO
2	GND (AUDIO)
3	VTR REC SW
4	REC LED
5	PB
6	AUDIO MUTE
7	MIC CUT
8	OSC ON
9	GND
10	DEW
11	5V1
12	TRACKING

To MAIN (SYS.CON.) PG908

CN107

1	S.REEL
2	END LAMP
3	REW END
4	FWD END
5	TAB
6	CASSETTE SW
7	T.REEL
8	UNLOAD
9	LOAD
10	M.STATE 0
11	M.STATE 1
12	M.STATE 2

To MAIN (SYS.CON.) PG907

PG117

1	GND
2	M. STATE 0
3	M. STATE 1
4	M. STATE 2

To MECH. STATE SW CN117

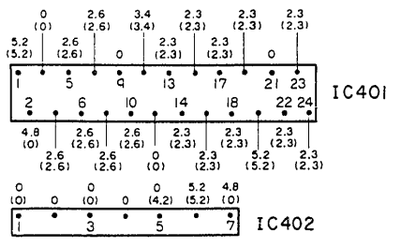
PG118

1	UNLOAD
2	——
3	LOAD

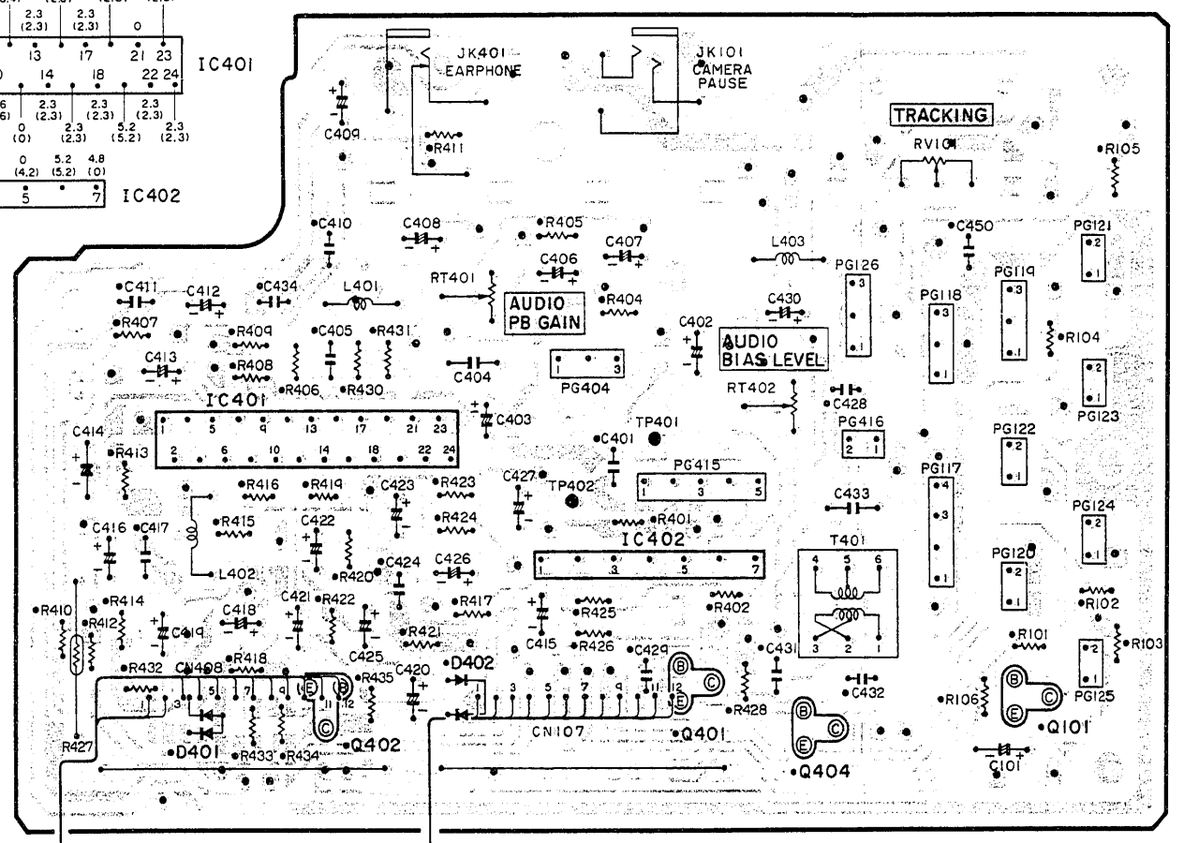
To LOADING MOTOR CN118

※ NOTE : MARK " • " IS LEADLESS(CH

AUDIO CIRCUIT BOARD



AUDIO CIRCUIT BOARD



AUDIO P.C.B

PG119

1	T.REEL
2	B+(SENSOR)
3	GND(SENSOR)

To TAKE-UP REEL SENSOR CN119

PG120

1	GND
2	DEW

To DEW SENSOR CN120

PG121

1	GND
2	CASSETE SW

To CST HOLDER SW CN121

PG122

1	GND
2	TAB

To SAFETY TAB SW CN122

PG123

1	FWD END
2	5VI

To SUPPLY END SENSOR CN123

PG124

1	REW END
2	5VI

To TAKE-UP END SENSOR CN124

PG125

1	END LAMP
2	B+(LED)

To END LAMP CN125

PG126

1	S.REEL
2	B+(SENSOR)
3	GND (SENSOR)

To SUPPLY REEL SENSOR CN126

PG404

1	AUDIO
2	GND (AUDIO)
3	MIC BIAS

To EVF CONNECTOR VIA CN004

PG415 CN415

1	PLAY	1
2	GND (AUDIO)	2
3	REC	3
4	GND (AUDIO)	4
5	ERASE	5

AUDIO REC/PB HEAD
AUDIO ERASE HEAD

PG416 CN416

1	GND (AUDIO)	1
2	ERASE	2

FULL ERASE HEAD

CN408

1	AUDIO
2	GND (AUDIO)
3	VTR REC SW
4	REC LED
5	PB
6	AUDIO MUTE
7	MIC CUT
8	OSC ON
9	GND
10	DEW
11	5VI
12	TRACKING

To MAIN (SYS.CON.) PG908

CN107

1	S.REEL
2	END LAMP
3	REW END
4	FWD END
5	TAB
6	CASSETTE SW
7	T.REEL
8	UNLOAD
9	LOAD
10	M.STATE 0
11	M.STATE 1
12	M.STATE 2

To MAIN (SYS.CON.) PG907

PG117

1	GND
2	M.STATE 0
3	M.STATE 1
4	M.STATE 2

To MECH. STATE SW CN117

PG118

1	UNLOAD
2	——
3	LOAD

To LOADING MOTOR CN118

※ NOTE : MARK " • " IS LEADLESS(CHIP) COMPONENT.

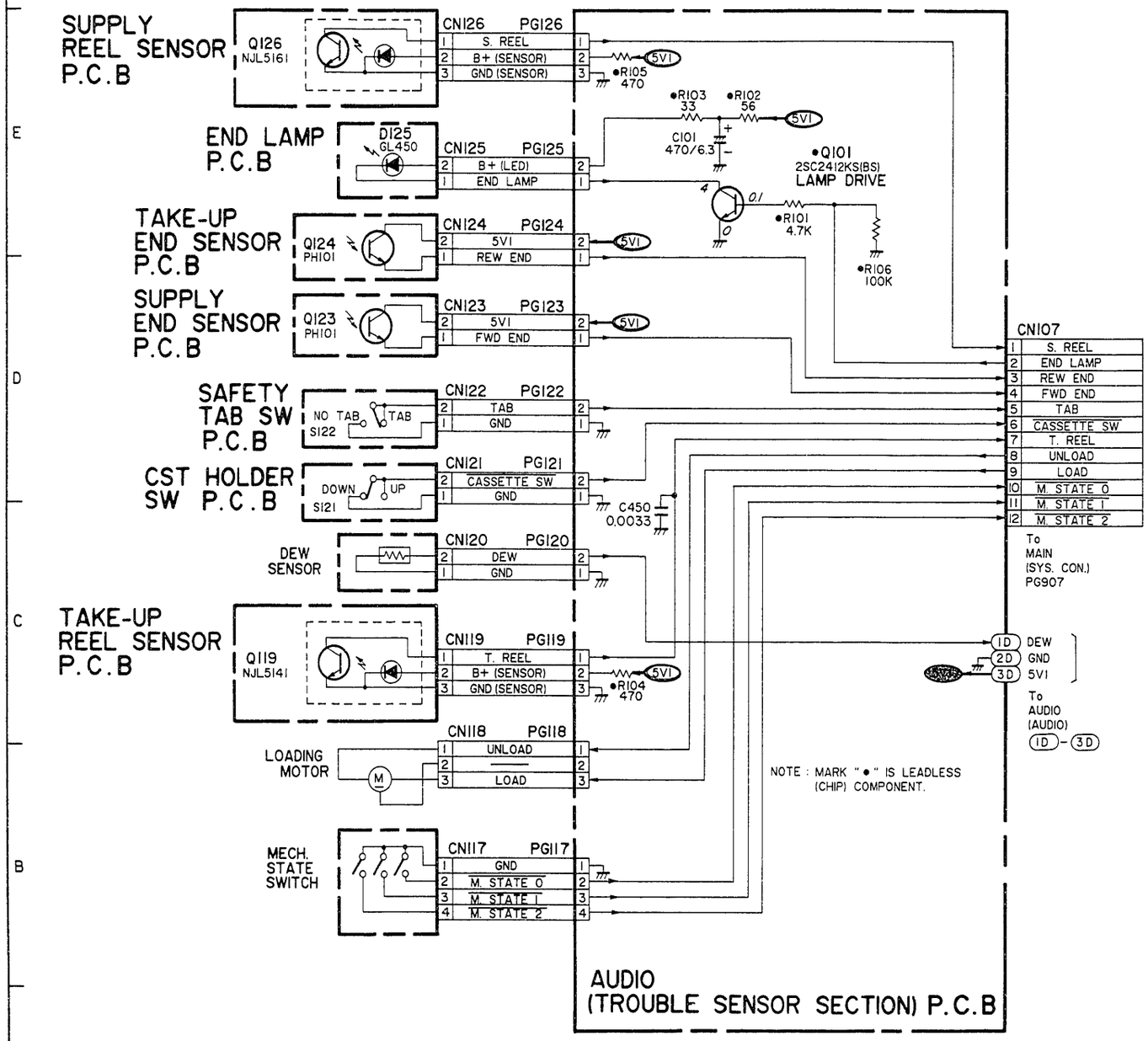
: Soldered side

: Parts side

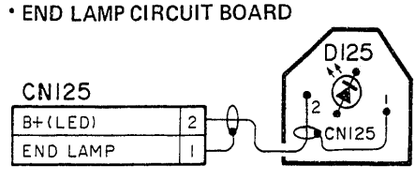
• : Through hole

SCHEMATIC DIAGRAMS	PAGE
SENSOR	79
CHROMA FILTER	87
PROCESS	89
ENCODER	100
WIRING	110
REGULATOR CONTROL	111
MIC JACK	116
ELECTRONIC VIEW FINDER	117
AUTO FOCUS	123
SYSTEM CONTROL	126
SWITCHING REGULATOR	129
SERVO	131
CYL. CAPST. MOTORS DRIVE	138
HEAD SW LUMA	139
CHROMA	141
FUNCTION SW	156
AUDIO	159
TROUBLE SENSOR	162

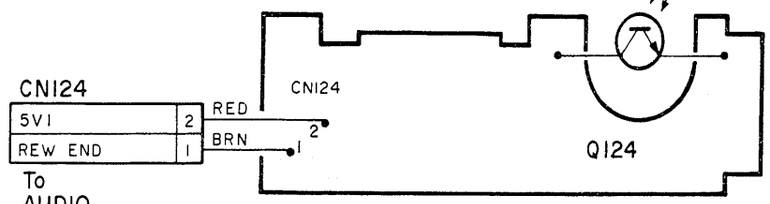
AUDIO (TROUBLE SENSOR) SCHEMATIC DIAGRAM



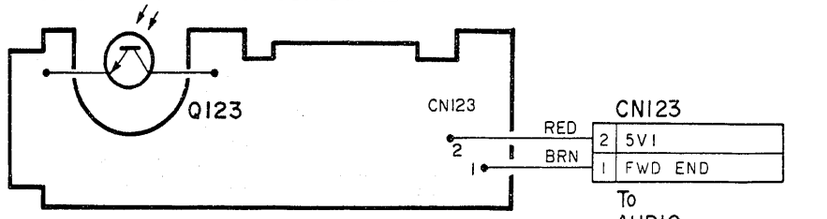
• END LAMP CIRCUIT BOARD



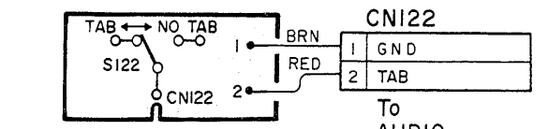
• TAKE-UP END SENSOR CIRCUIT BOARD



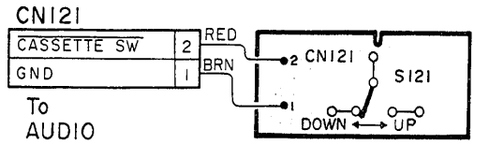
• SUPPLY END SENSOR CIRCUIT BOARD

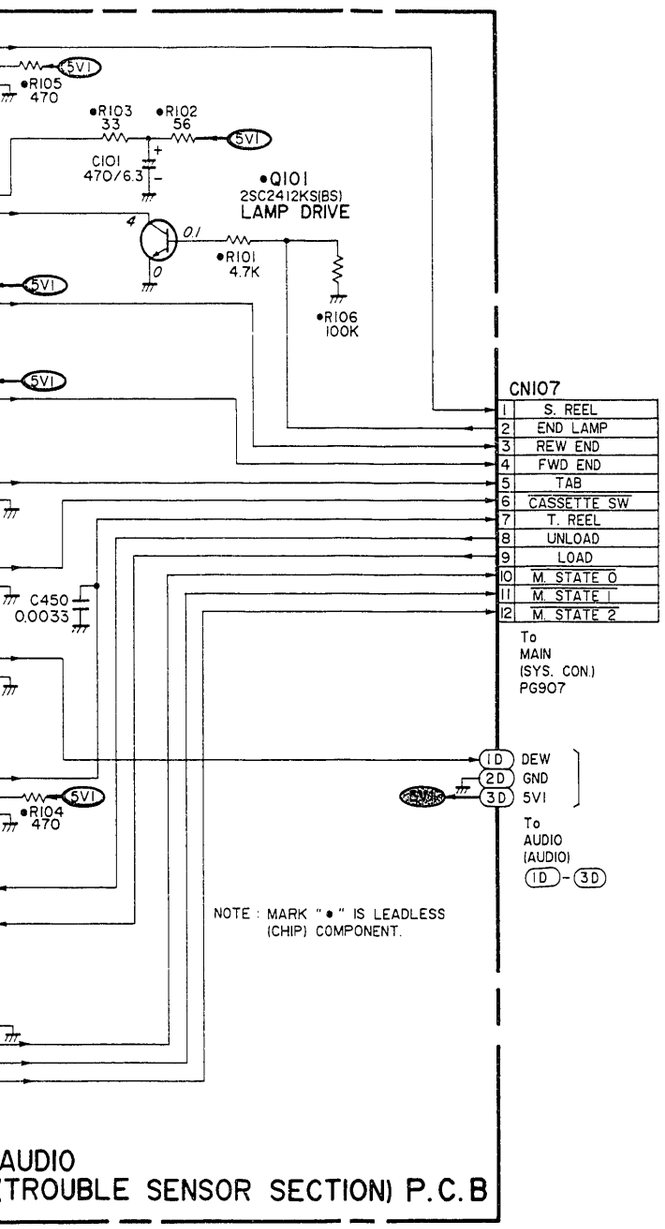


• SAFETY TAB SW CIRCUIT BOARD

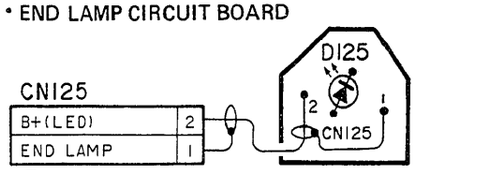


• CASSETTE HOLDER SW CIRCUIT BOARD

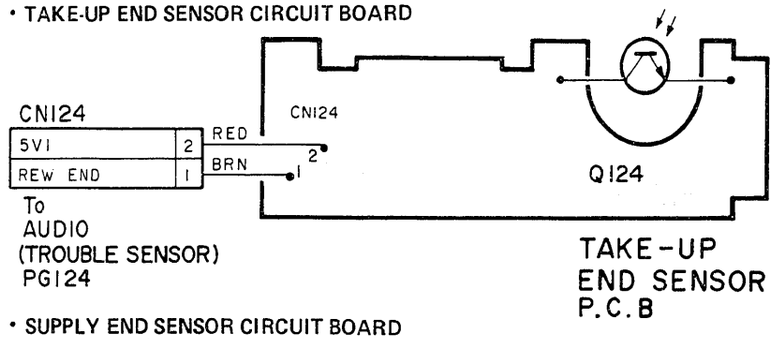




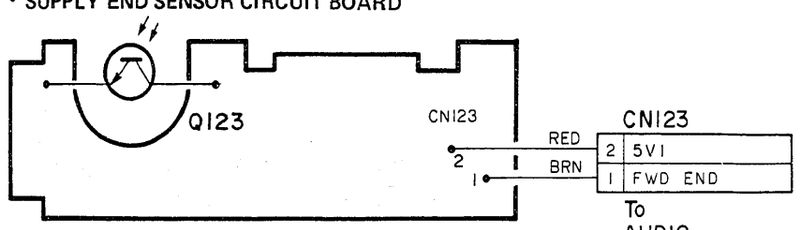
• END LAMP CIRCUIT BOARD



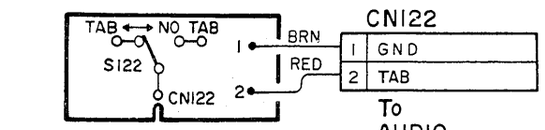
• TAKE-UP END SENSOR CIRCUIT BOARD



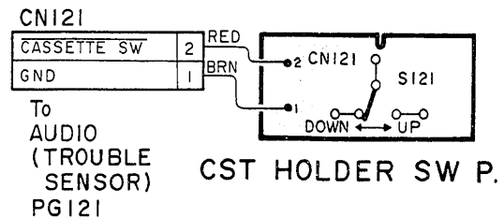
• SUPPLY END SENSOR CIRCUIT BOARD



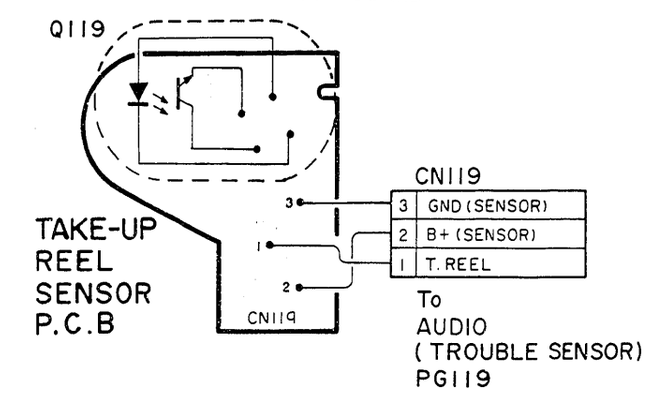
• SAFETY TAB SW CIRCUIT BOARD



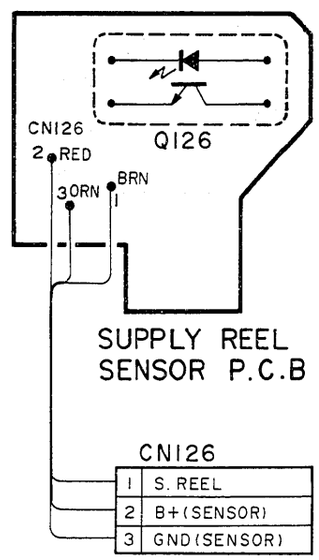
• CASSETTE HOLDER SW CIRCUIT BOARD



• TAKE UP REEL SENSOR CIRCUIT BOARD

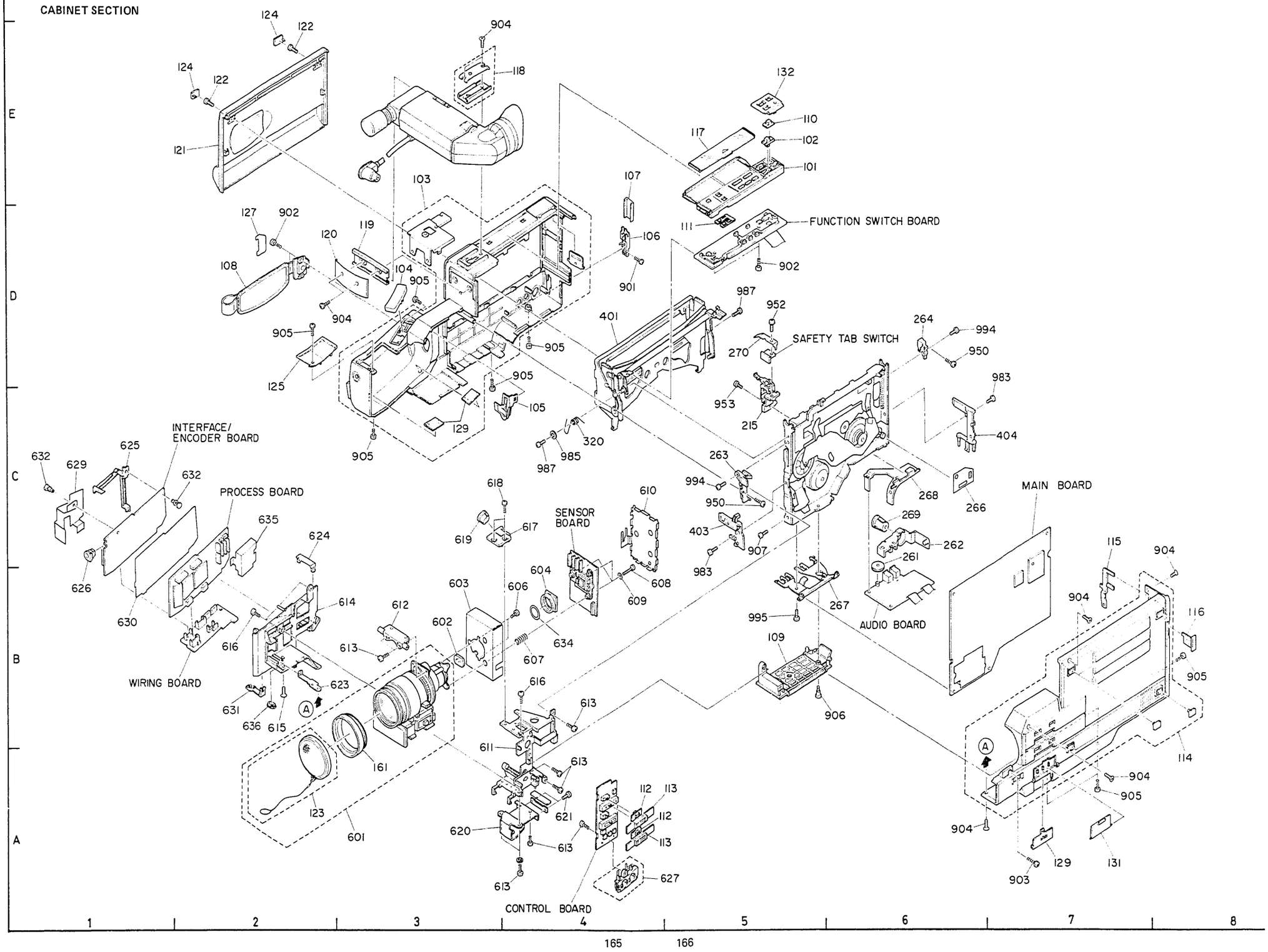


• SUPPLY REEL SENSOR

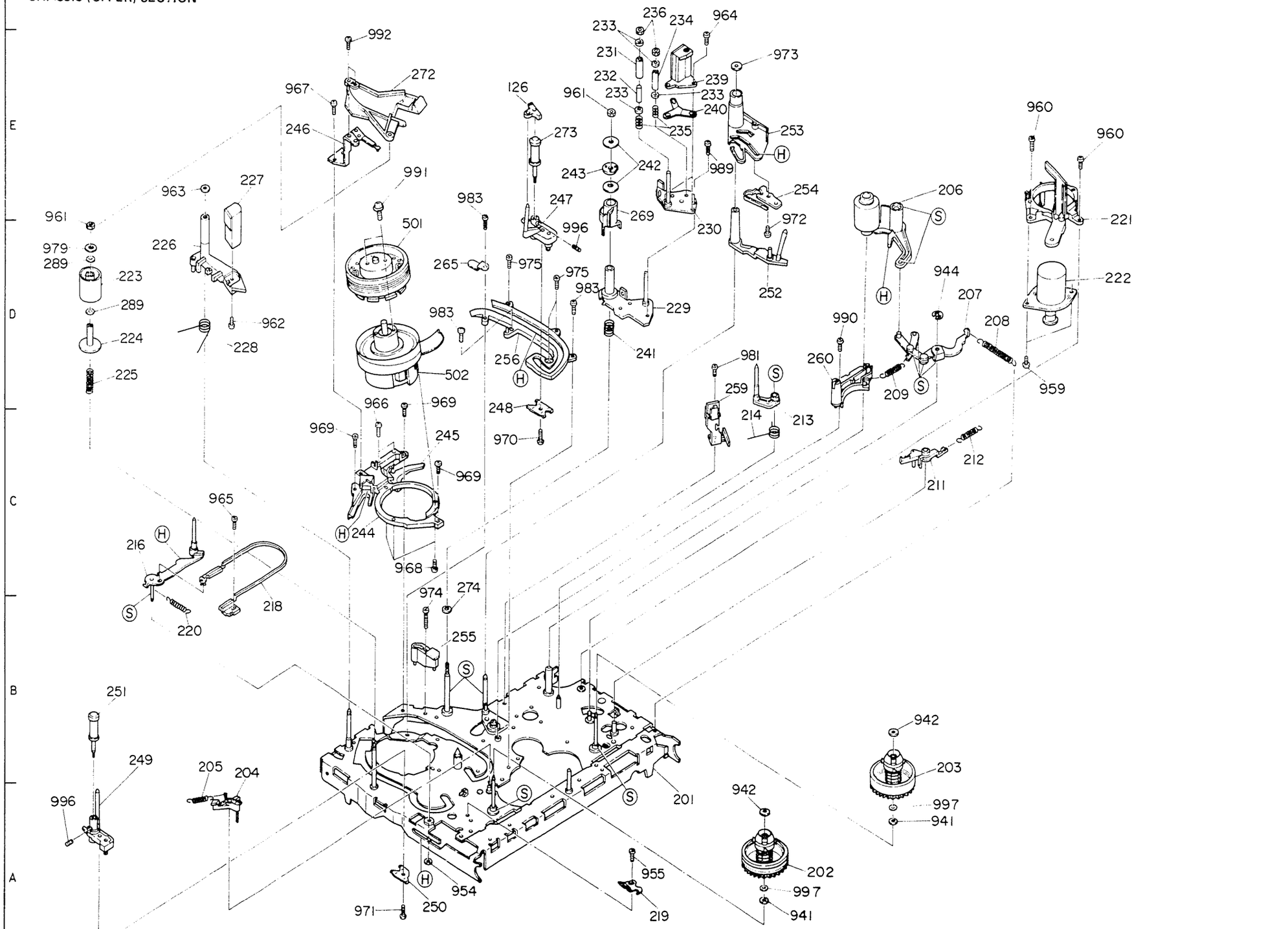


EXPLODED VIEW

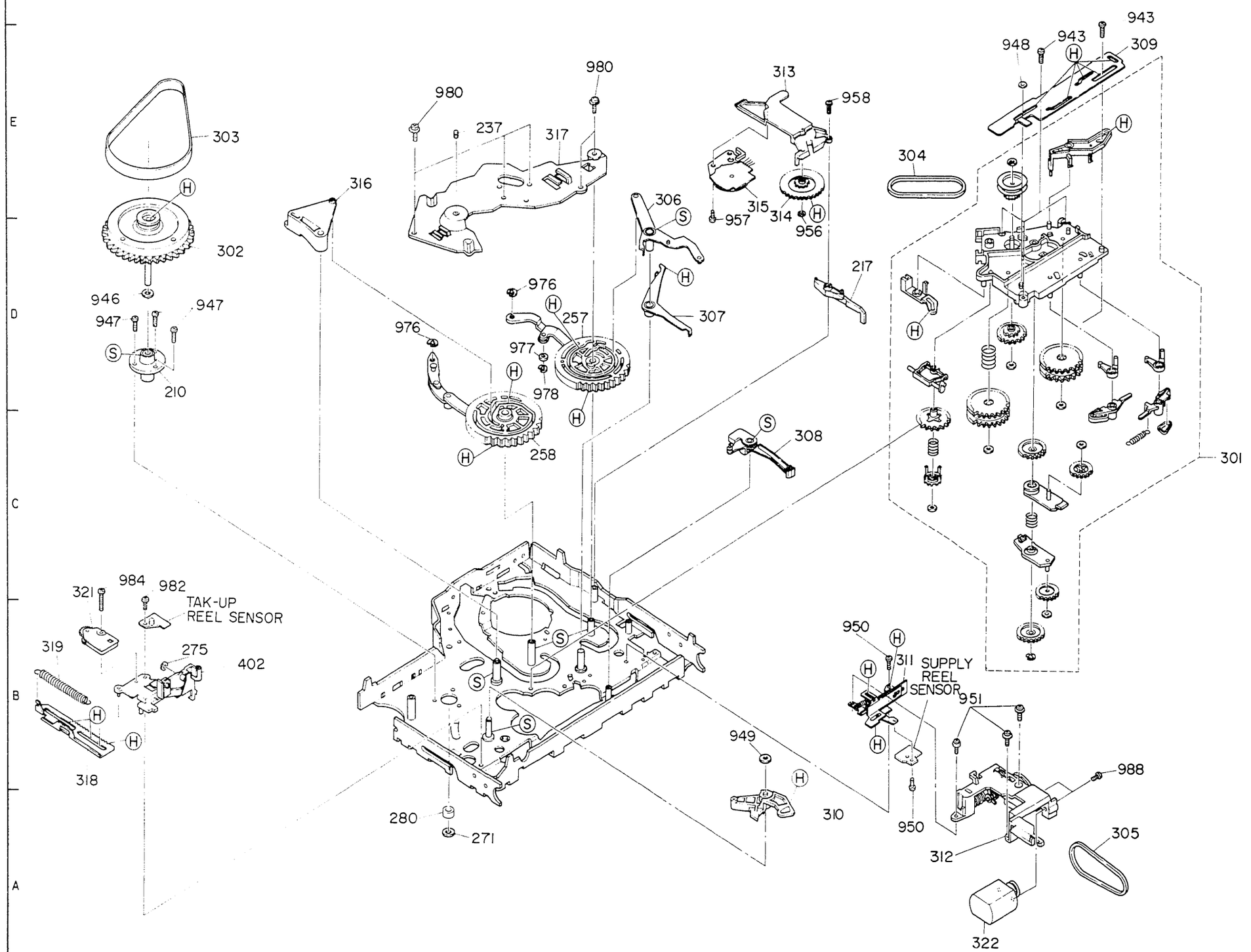
CABINET SECTION



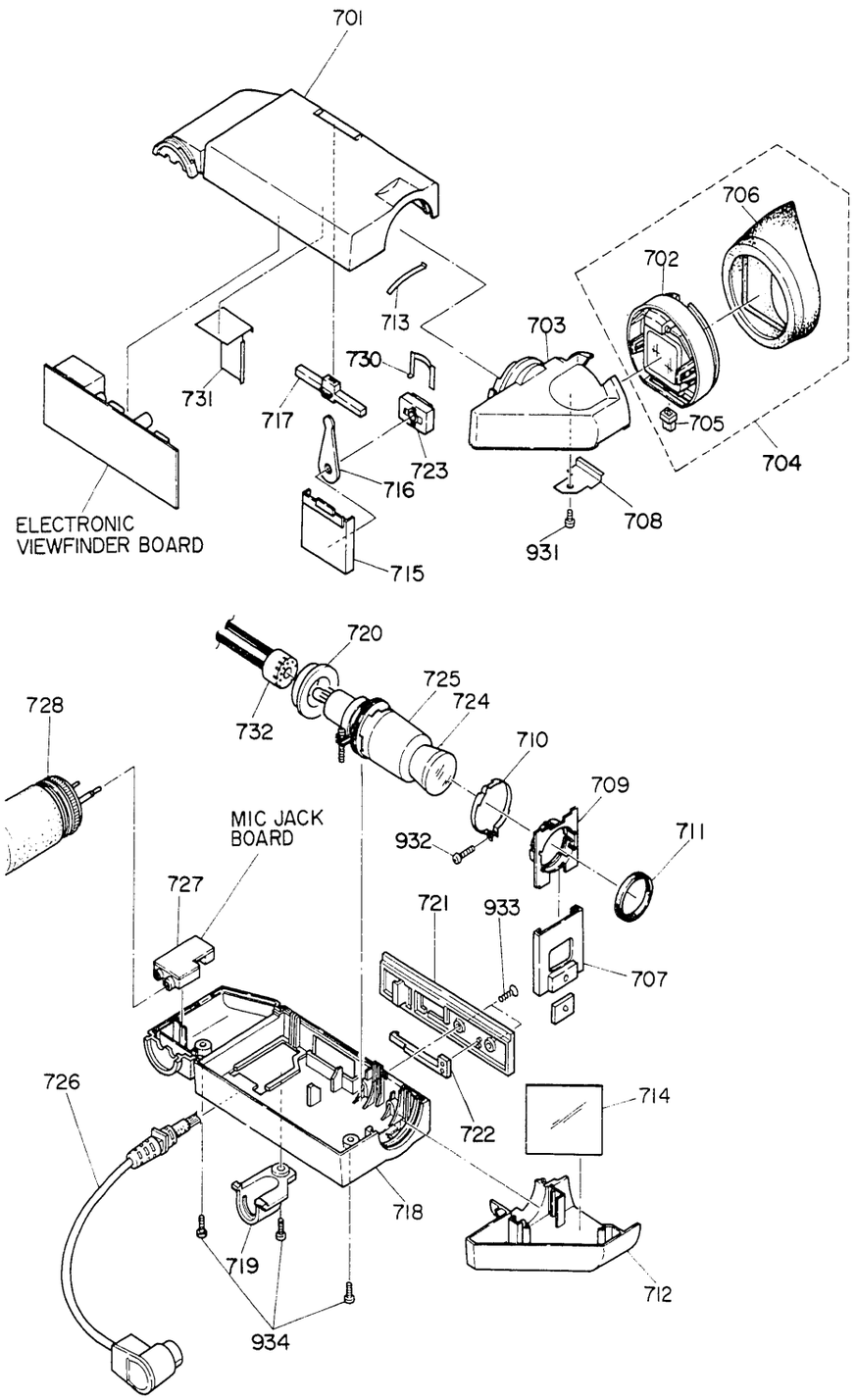
CHASSIS (UPPER) SECTION



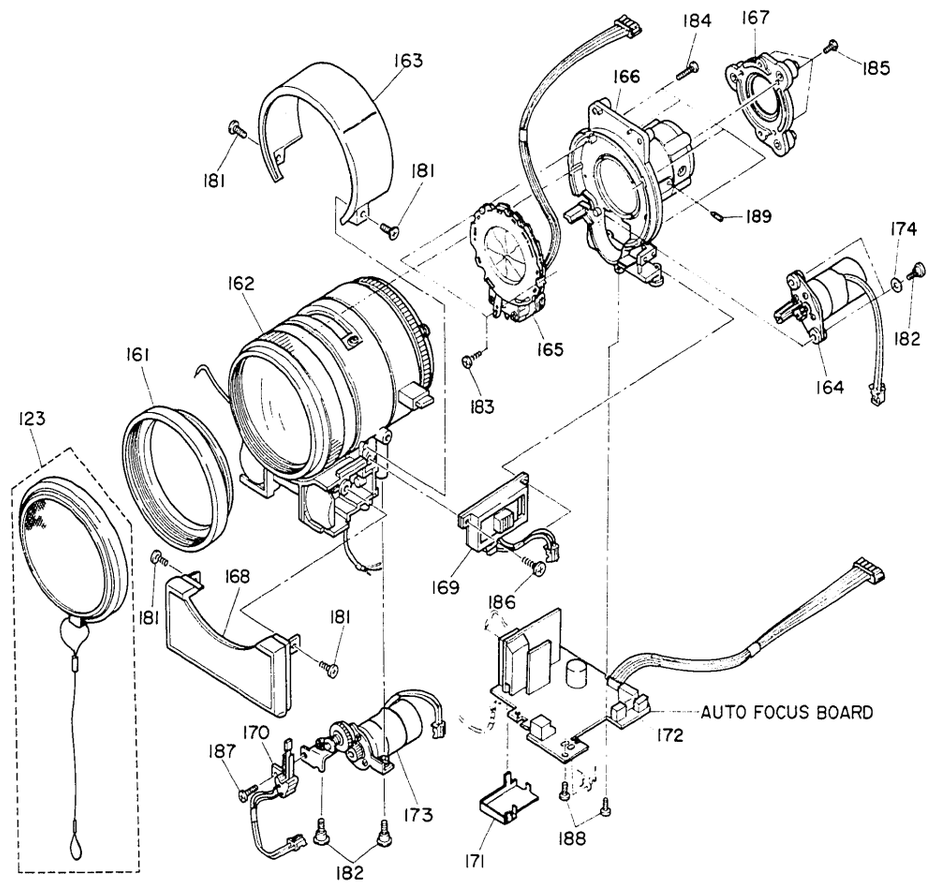
CHASSIS (LOWER) SECTION



ELECTRONIC VIEW FINDER SECTION



LENS SECTION



LUBRICATION

Lubrication points are shown in the exploded view diagrams by marks (S , H)
Lubricants shown in the diagram are as follows

S Sonic slider oil (= 1600)
H Hitazol (MO-138)

SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
C 050	0201007	CAPACITOR 0.01UF+-20% 50V
C 051	0201007	CAPACITOR 0.01UF+-20% 50V
C 201	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 203	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 204	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 205	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 206	0256155	CAPACITOR ELECTROLYTIC 10MF 16V
C 207	0201007	CAPACITOR 0.01UF+-20% 50V
C 208	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 209	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 210	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 211	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 212	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 213	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 214	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 215	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 216	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 217	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 218	0256155	CAPACITOR ELECTROLYTIC 10MF 16V
C 220	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 221	0256159	CAPACITOR ELECTROLYTIC 100MF 6.3V
C 222	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 223	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 224	0256159	CAPACITOR ELECTROLYTIC 100MF 6.3V
C 225	0201037	CERAMIC CHIP 330PF+-5% 50V
C 226	0256154	CAPACITOR 4.7UF 25V ELECTROLYTIC
C 227	0256790	ELECTROLYTIC 220MF.6.3V
C 228	0256159	CAPACITOR ELECTROLYTIC 100MF 6.3V
C 229	0256154	CAPACITOR 4.7UF 25V ELECTROLYTIC
C 230	0201029	CERAMIC CHIP 68PF+-5% 50V
C 231	0256693	ELECTROLYTIC 33UF 6.3V
C 232	0256155	CAPACITOR ELECTROLYTIC 10MF 16V
C 233	0256788	CAPACITOR 1000UF 6.3V
C 234	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 235	0256154	CAPACITOR 4.7UF 25V ELECTROLYTIC
C 236	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 237	0201032	CERAMIC CHIP 120PF+-5% 50V
C 238	0256155	CAPACITOR ELECTROLYTIC 10MF 16V
C 239	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 241	0256152	CAPACITOR ELECTROLYTIC 2.2MF 50V
C 242	0256790	ELECTROLYTIC 220UF 6.3V
C 243	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 244	0201007	CAPACITOR 0.01UF+-20% 50V
C 245	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 246	0201007	CAPACITOR 0.01UF+-20% 50V
C 247	0256609	ELECTROLYTIC 0.1MF.50V
C 248	0256610	ELECTROLYTIC 0.22UF 50V
C 249	0256152	CAPACITOR ELECTROLYTIC 2.2MF 50V
C 250	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 251	0201007	CAPACITOR 0.01UF+-20% 50V
C 252	0201031	CAPACITOR 100PF+-5%
C 253	0201026	CAPACITOR 39PF+-5% 50V CERAMIC CHIP
C 254	0201007	CAPACITOR 0.01UF+-20% 50V
C 256	0201007	CAPACITOR 0.01UF+-20% 50V

SYMBOL-NO	P-NO	DESCRIPTION
C 257	0201032	CERAMIC CHIP 120PF+-5% 50V
C 258	0201007	CAPACITOR 0.01UF+-20% 50V
C 261	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 262	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 263	0201001	CAPACITOR 22PF+-5% 50V CERAMIC CHIP
C 264	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 265	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 266	0201001	CAPACITOR 22PF+-5% 50V CERAMIC CHIP
C 267	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 268	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 269	0201001	CAPACITOR 22PF+-5% 50V CERAMIC CHIP
C 270	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 271	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 272	0201001	CAPACITOR 22PF+-5% 50V CERAMIC CHIP
C 273	0201007	CAPACITOR 0.01UF+-20% 50V
C 274	0201008	CERAMIC CHIP 0.015MF+-10%
C 275	0201042	CERAMIC CHIP 820PF+-5%
C 277	0201060	CERAMIC CHIP 3300PF+-20% 50V
C 278	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 279	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 281	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 282	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 283	0201003	CERAMIC CHIP 0.001UF+-20% 50V
C 284	0201041	CERAMIC CHIP 680PF+-5% 50V
C 285	0201040	CAPACITOR 560PF+-5%
C 286	0201035	CERAMIC CHIP 220PF+-5% 50V
C 287	0201027	CAPACITOR 47PF+-5% 50V CERAMIC CHIP
C 288	0201023	CERAMIC CHIP 18PF+-5% 50V
C 289	0201100	CERAMIC CHIP 0.033MF+-10%
C 290	0201100	CERAMIC CHIP 0.033MF+-10%
C 291	0201039	CERAMIC CHIP 470PF+-5% 50V
C 292	0201003	CERAMIC CHIP 0.001UF+-20% 50V
C 293	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 295	0256155	CAPACITOR ELECTROLYTIC 10MF 16V
C 296	0201039	CERAMIC CHIP 470PF+-5% 50V
C 297	0201031	CAPACITOR 100PF+-5%
C 298	0201032	CERAMIC CHIP 120PF+-5% 50V
C 299	0201001	CAPACITOR 22PF+-5% 50V CERAMIC CHIP
C 300	0256856	ELECTROLYTIC 330UF 6.3V
C 301	0201003	CERAMIC CHIP 0.001UF+-20% 50V
C 302	0256154	CAPACITOR 4.7UF 25V ELECTROLYTIC
C 303	0256155	CAPACITOR ELECTROLYTIC 10MF 16V
C 306	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 309	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 311	0201029	CERAMIC CHIP 68PF+-5% 50V
C 312	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 313	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 314	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 315	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 401	0201049	CERAMIC CHIP 390PF+-10% 50V
C 402	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 403	0256834	ELECTROLYTIC 10UF 16V
C 405	0201007	CAPACITOR 0.01UF+-20% 50V
C 406	0256161	CAPACITOR ELECTROLYTIC 22MF 6.3V
C 407	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C 408	0256685	CAPACITOR 1UF 50V ELECTROLYTIC

SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
C 409	0256689	ELECTROLYTIC 10UF 6.3V
C 410	0201061	CAPACITOR 0.0047UF+-10% 50V CERAMIC CHIP
C 411	0201061	CAPACITOR 0.0047UF+-10% 50V CERAMIC CHIP
C 412	0256688	CAPACITOR 4.7UF 16V ELECTROLYTIC
C 413	0256688	CAPACITOR 4.7UF 50V ELECTROLYTIC
C 414	0256608	ELECTROLYTIC 220MF.6.3V
C 415	0256688	CAPACITOR 4.7UF 16V ELECTROLYTIC
C 416	0256689	ELECTROLYTIC 10UF 6.3V
C 417	0201007	CAPACITOR 0.01UF+-20% 50V
C 418	0256689	ELECTROLYTIC 10UF 6.3V
C 419	0256159	CAPACITOR ELECTROLYTIC 100MF 6.3V
C 420	0256159	CAPACITOR ELECTROLYTIC 100MF 6.3V
C 421	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C 422	0256159	CAPACITOR ELECTROLYTIC 100MF 6.3V
C 423	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 424	0201049	CERAMIC CHIP 390PF+-10% 50V
C 425	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C 426	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 427	0256161	CAPACITOR ELECTROLYTIC 22MF 6.3V
C 428	0201047	CERAMIC CHIP 220PF+-10% 50V
C 429	0201061	CAPACITOR 0.0047UF+-10% 50V CERAMIC CHIP
C 430	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 431	0201008	CERAMIC CHIP 0.015MF+-10%
C 432	0201061	CAPACITOR 0.0047UF+-10% 50V CERAMIC CHIP
C 434	0201059	CERAMIC CHIP 0.0033UF+-10% 50V
C 450	0201059	CERAMIC CHIP 0.0033UF+-10% 50V
C 601	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 602	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C 603	0201100	CERAMIC CHIP 0.033MF+-10%
C 604	0256689	ELECTROLYTIC 10UF 6.3V
C 605	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU
C 608	0201003	CERAMIC CHIP 0.001UF+-20% 50V
C 609	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 611	0201007	CAPACITOR 0.01UF+-20% 50V
C 612	0201007	CAPACITOR 0.01UF+-20% 50V
C 613	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C 614	0201029	CERAMIC CHIP 68PF+-5% 50V
C 615	0201035	CERAMIC CHIP 220PF+-5% 50V
C 616	0201031	CAPACITOR 100PF+-5%
C 617	0201007	CAPACITOR 0.01UF+-20% 50V
C 620	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 623	0256475	TANTALUM 4.7UF+-30% 10V
C 624	0201057	CERAMIC CHIP 0.0022UF+-10% 50V
C 625	0201057	CERAMIC CHIP 0.0022UF+-10% 50V
C 626	0201057	CERAMIC CHIP 0.0022UF+-10% 50V
C 627	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C 630	0201007	CAPACITOR 0.01UF+-20% 50V
C 632	0256689	ELECTROLYTIC 10UF 6.3V
C 635	0201007	CAPACITOR 0.01UF+-20% 50V
C 636	0256689	ELECTROLYTIC 10UF 6.3V
C 637	0256689	ELECTROLYTIC 10UF 6.3V
C 638	0201057	CERAMIC CHIP 0.0022UF+-10% 50V
C 639	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 641	0256687	ELECTROLYTIC 3.3UF 25V

SYMBOL-NO	P-NO	DESCRIPTION
C 642	0256687	ELECTROLYTIC 3.3UF 25V
C 643	0256687	ELECTROLYTIC 3.3UF 25V
C 644	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C 645	0256689	ELECTROLYTIC 10UF 6.3V
C 647	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 648	0256684	CAPACITOR 0.47UF 50V ELECTROLYTIC
C 649	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 650	0256681	CAPACITOR 0.1UF 50V ELECTROLYTIC
C 651	0256693	ELECTROLYTIC 33UF 6.3V
C 652	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 656	0201003	CERAMIC CHIP 0.001UF+-20% 50V
C 657	0256159	CAPACITOR ELECTROLYTIC 100MF 6.3V
C 658	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 659	0201007	CAPACITOR 0.01UF+-20% 50V
C 660	0201007	CAPACITOR 0.01UF+-20% 50V
C 901	0201025	CERAMIC CHIP 33PF+-5%
C 902	0201025	CERAMIC CHIP 33PF+-5%
C 904	0256630	ELECTROLYTIC 100MF.6.3V
C 905	0256155	CAPACITOR ELECTROLYTIC 10MF 16V
C 910	0201072	CAPACITOR 0.047UF+80-20%
C 911	0201072	CAPACITOR 0.047UF+80-20%
C 912	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 913	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 914	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C 915	0201100	CERAMIC CHIP 0.033MF+-10%
C 916	0201100	CERAMIC CHIP 0.033MF+-10%
C 918	0256154	CAPACITOR 4.7UF 25V ELECTROLYTIC
C 919	0256489	ELECTROLYTIC 0.0047F 5.5V
C 921	0256606	ELECTROLYTIC 1MF.50V
C 923	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 924	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C 928	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C 929	0256694	ELECTROLYTIC 22UF 6.3V
C 930	0256688	CAPACITOR 4.7UF 16V ELECTROLYTIC
C 931	0256689	ELECTROLYTIC 10UF 6.3V
C 933	0256151	CAPACITOR ELECTROLYTIC 1MF 50V
C 951	0256160	CAPACITOR ELECTROLYTIC 47MF 6.3V
C 952	0256158	CAPACITOR 43UF 16V ELECTROLYTIC
C 953	0256158	CAPACITOR 43UF 16V ELECTROLYTIC
C 954	0256159	CAPACITOR ELECTROLYTIC 100MF 6.3V
C 955	0256688	CAPACITOR 4.7UF 16V ELECTROLYTIC
C 956	0256158	CAPACITOR 43UF 16V ELECTROLYTIC
C 957	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
CT1001	5058541	TRIMMER 5-35P
CT1101	5058561	TRIMMER 50PF
CT1301	5058092	TRIMMER 35PF
CT1401	5058092	TRIMMER 35PF
C1001	0256381	CAPACITOR 3.3UF 16V ELECTROLYTIC
C1002	0256475	TANTALUM 4.7UF+-30% 10V
C1003	0256835	ELECTROLYTIC 1UF 50V
C1004	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU
C1005	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU
C1006	0256407	CAPACITOR 47UF 10V ELECTROLYTIC TANTALUM
C1007	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU
C1008	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU

SYMBOL-NO	P-NO	DESCRIPTION
		CAPACITORS
C1009	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU
C1010	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU
C1011	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU
C1012	0256471	CAPACITOR 10UF 6.3V ELECTROLYTIC TANTALU
C1013	0256402	CAPACITOR 22UF 10V ELECTROLYTIC TANTALUM
C1014	0256381	CAPACITOR 3.3UF 16V ELECTROLYTIC
C1015	0256475	TANTALUM 4.7UF+-30% 10V
C1016	0256381	CAPACITOR 3.3UF 16V ELECTROLYTIC
C1055	0201020	CAPACITOR 10PF+-0.5PF 50V CERAMIC CHIP
C1056	0201006	CAPACITOR 0.01μF+-5%
C1057	0201054	CAPACITOR 1000PF+-10% 50V CERAMIC CHIP
C1059	0201024	CAPACITOR 27PF+-5%
C1062	0201006	CAPACITOR 0.01UF+80-20% CERAMIC CHIP
C1063	0201006	CAPACITOR 0.01UF+80-20% CERAMIC CHIP
C1064	0201006	CAPACITOR 0.01UF+80-20% CERAMIC CHIP
C1065	0201026	CAPACITOR 39PF+-5% 50V CERAMIC CHIP
C1101	0256692	CAPACITOR 22UF 16V ELECTROLYTIC
C1103	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C1104	0256692	CAPACITOR 22UF 16V ELECTROLYTIC
C1105	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C1106	0256688	CAPACITOR 4.7UF 16V ELECTROLYTIC
C1107	0256692	CAPACITOR 22UF 16V ELECTROLYTIC
C1109	0256692	CAPACITOR 22UF 16V ELECTROLYTIC
C1110	0256687	ELECTROLYTIC 3.3UF 25V
C1111	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C1112	0256782	CAPACITOR 220UF 10V ELECTROLYTIC
C1113	0256692	CAPACITOR 22UF 16V ELECTROLYTIC
C1114	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C1115	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C1116	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C1117	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C1118	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1119	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1122	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1151	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1152	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1153	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1154	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1155	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1156	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1159	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1160	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1161	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1162	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1163	0201992	CERAMIC DISC 0.1UF+-5% 50V
C1164	0201992	CERAMIC DISC 0.1UF+-5% 50V
C1165	0201992	CERAMIC DISC 0.1UF+-5% 50V
C1166	0201992	CERAMIC DISC 0.1UF+-5% 50V
C1167	0201041	CERAMIC CHIP 680PF+-5% 50V
C1168	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1173	0201992	CERAMIC DISC 0.1UF+-5% 50V
C1174	0201992	CERAMIC DISC 0.1UF+-5% 50V
C1175	0201992	CERAMIC DISC 0.1UF+-5% 50V
C1176	0201992	CERAMIC DISC 0.1UF+-5% 50V

SYMBOL-NO	P-NO	DESCRIPTION
C1180	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1181	0201062	CAPACITOR 0.0068UF+-10% 50V CERAMIC CHIP
C1182	0201027	CAPACITOR 47PF+-5% 50V CERAMIC CHIP
C1301	0256782	CAPACITOR 220UF 10V ELECTROLYTIC
C1302	0256692	CAPACITOR 22UF 16V ELECTROLYTIC
C1320	0201001	CAPACITOR 22PF+-5% 50V CERAMIC CHIP
C1321	0201061	CAPACITOR 0.0047μF+-20% 50V
C1322	0201007	CAPACITOR 0.0068μF+-20% 50V
C1323	0201015	CERAMIC CHIP 0.0068μF+-0.25PF 50V
C1324	0201001	CAPACITOR 0.0068μF+-5% 50V CERAMIC CHIP
C1325	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1327	0201007	CAPACITOR 0.01UF+-20% 50V
C1328	0201015	CERAMIC CHIP 5PF+-0.25PF 50V
C1401	0256158	CAPACITOR 47UF 16V ELECTROLYTIC
C1402	0256170	CAPACITOR 100UF 10V ELECTROLYTIC
C1403	0256158	CAPACITOR 47UF 16V ELECTROLYTIC
C1404	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1406	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1407	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1408	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1409	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1410	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1412	0256688	CAPACITOR 4.7UF 16V ELECTROLYTIC
C1601	0256158	CAPACITOR 47UF 16V ELECTROLYTIC
C1602	0256158	CAPACITOR 47UF 16V ELECTROLYTIC
C1603	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1801	0256195	ELECTORLYTIC 220MF.10V
C1802	0201069	CAPACITOR 0.1UF+80-20% 25V CERAMIC CHIP
C1804	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1806	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1807	0256690	CAPACITOR 10UF 16V ELECTROLYTIC
C1811	0201065	CAPACITOR 0.022UF+-10% 25V CERAMIC CHIP
C1812	0256685	CAPACITOR 1UF 50V ELECTROLYTIC
C1813	0256687	ELECTROLYTIC 3.3UF 25V
C1814	0256360	CAPACITOR 0.1UF 35V ELECTROLYTIC
C1817	0256363	TANTALUM ELECTROLYTIC 0.33MF.35V
C1818	0256692	CAPACITOR 22UF 16V ELECTROLYTIC
C1819	0201040	CAPACITOR 560PF+-5%
C1820	0201008	CERAMIC CHIP 0.015MF+-10%
C1821	0201989	CERAMIC CHIP 0.1MF+-20%
C1822	0201039	CERAMIC CHIP 470PF+-5% 50V
C1827	0201989	CERAMIC CHIP 0.1MF+-20%
C1831	0201007	CAPACITOR 0.01UF+-20% 50V
C1832	0201062	CAPACITOR 0.0068UF+-10% 50V CERAMIC CHIP
C1833	0201062	CAPACITOR 0.0068UF+-10% 50V CERAMIC CHIP
C1834	0201062	CAPACITOR 0.0068UF+-10% 50V CERAMIC CHIP
C1835	0201039	CERAMIC CHIP 470PF+-5% 50V
C1838	0256170	CAPACITOR 1000UF 10V ELECTROLYTIC
C1840	0256752	CAPACITOR 3.3UF 63V ELECTROLYTIC
C1852	0256782	CAPACITOR 220UF 10V ELECTROLYTIC
C1905	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
		RESISTORS
R 051	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 052	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 053	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
		RESISTORS
R 054	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 061	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 062	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 063	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R 064	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 065	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R 066	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 067	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 068	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 069	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 070	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 071	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 072	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 073	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 074	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 101	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 102	0103820	CHIP RESISTOR 56OHM+-5% 0.1W
R 103	0103825	CHIP RESISTOR 33OHM+-5% 0.1W
R 104	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 105	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 106	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 201	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 202	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 203	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 204	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 205	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 206	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 207	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 208	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 209	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 210	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 211	0103835	CHIP RESISTOR 220OHM+-5% 0.1W
R 212	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 213	0103819	CHIP RESISTOR 100HM+-5% 0.1W
R 214	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 215	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R 216	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R 217	0103836	CHIP RESISTOR 270OHM+-5% 0.1W
R 219	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 220	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 221	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 222	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 223	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 224	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 225	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 226	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 227	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 228	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 229	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 230	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 231	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 232	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 233	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 234	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
R 235	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R 236	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R 237	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 238	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R 239	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 240	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 241	0103819	CHIP RESISTOR 100HM+-5% 0.1W
R 242	0103819	CHIP RESISTOR 100HM+-5% 0.1W
R 243	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 244	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 245	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 246	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 247	0103840	CHIP RESISTOR 560OHM+-5% 0.1W
R 248	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R 249	0103836	CHIP RESISTOR 270OHM+-5% 0.1W
R 250	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 251	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 252	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R 253	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 254	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 255	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R 256	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 257	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 258	0103841	CHIP RESISTOR 680OHM+-5% 0.1W
R 259	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 260	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 261	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 262	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 263	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 264	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 265	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 266	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 267	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 269	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 270	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 271	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 272	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 273	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 274	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 275	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 276	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 277	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 278	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 279	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R 280	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 281	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 282	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 283	0103841	CHIP RESISTOR 680OHM+-5% 0.1W
R 284	0103835	CHIP RESISTOR 220OHM+-5% 0.1W
R 285	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R 287	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R 288	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R 289	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R 290	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 291	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R 292	0103819	CHIP RESISTOR 100HM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
		RESISTORS
R 293	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 295	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 296	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R 297	0103824	CHIP RESISTOR 27 OHM+-5% 0.1W
R 298	0103833	CHIP RESISTOR 150OHM+-5% 0.1W
R 300	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 301	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R 302	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 304	0103835	CHIP RESISTOR 220OHM+-5% 0.1W
R 305	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 306	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 307	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 308	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 310	0103842	CHIP RESISTOR 8200HM+-5% 0.1W
R 312	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 313	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 314	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R 315	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 316	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R 317	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 401	0103819	CHIP RESISTOR 100HM+-5% 0.1W
R 402	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 404	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R 405	0103837	CHIP RESISTOR 3300HM+-5% 0.1W
R 406	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 407	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 408	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R 409	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 410	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 411	0103827	CHIP RESISTOR 47OHM+-5% 0.1W
R 412	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 413	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R 414	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 415	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R 416	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 417	0103872	CHIP RESISTOR 270KOHM+-5% 0.1W
R 418	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 419	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R 420	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 421	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R 422	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 423	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 424	0103835	CHIP RESISTOR 2200HM+-5% 0.1W
R 425	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 426	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 427	0170474	FUSE RESISTOR 10 OHM+-5% 1/4W
R 428	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R 430	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R 431	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R 432	0103837	CHIP RESISTOR 3300HM+-5% 0.1W
R 433	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 434	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 435	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 607	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 608	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 609	0103833	CHIP RESISTOR 150OHM+-5% 0.1W
R 610	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 611	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 614	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 615	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 616	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 617	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 618	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 619	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R 621	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 622	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 623	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 624	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 625	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R 626	0103829	CHIP RESISTOR 68OHM+-5% 0.1W
R 627	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 628	0103837	CHIP RESISTOR 3300HM+-5% 0.1W
R 629	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R 630	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 631	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R 632	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 633	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 634	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R 635	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 637	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R 638	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 639	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 640	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R 641	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R 642	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R 643	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R 645	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R 646	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R 647	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R 648	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 650	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 651	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 652	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R 653	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 654	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 655	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 656	0103831	CHIP RESISTOR 100OHM+-5% 0.1W
R 657	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 658	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 659	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 660	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 661	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 662	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R 663	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 664	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R 666	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R 667	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 668	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R 669	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 670	0103837	CHIP RESISTOR 3300HM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
		RESISTORS
R 671	0103819	CHIP RESISTOR 100HM+-5% 0.1W
R 672	0103819	CHIP RESISTOR 100HM+-5% 0.1W
R 673	0103819	CHIP RESISTOR 100HM+-5% 0.1W
R 674	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 675	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 676	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 678	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R 679	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 680	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R 681	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R 682	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R 683	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 684	0103835	CHIP RESISTOR 220OHM+-5% 0.1W
R 685	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 686	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 687	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 688	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 689	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 690	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R 691	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 693	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R 694	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 695	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 696	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 901	0103841	CHIP RESISTOR 680OHM+-5% 0.1W
R 902	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 903	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 904	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 905	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 906	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 907	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 908	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 909	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 910	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 911	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 912	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 913	0103836	CHIP RESISTOR 270OHM+-5% 0.1W
R 914	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 915	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R 916	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 917	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 918	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 919	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 920	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R 921	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 923	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R 924	0103875	CHIP RESISTOR 470KOHM+-5% 0.1W
R 925	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R 926	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 927	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R 928	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R 929	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 930	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R 931	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R 932	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 933	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 934	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 935	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 936	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 937	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 938	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 939	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R 940	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 941	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R 942	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 943	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 944	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 945	0103875	CHIP RESISTOR 470KOHM+-5% 0.1W
R 946	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 947	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R 948	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R 950	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R 951	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R 952	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 953	0103838	CHIP RESISTOR 390OHM+-5% 0.1W
R 954	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R 955	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 956	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 957	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R 958	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 959	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 961	0103837	CHIP RESISTOR 3300HM+-5% 0.1W
R 962	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 963	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 964	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 965	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 966	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R 967	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 968	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R 969	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 970	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 971	0103831	CHIP RESISTOR 100OHM+-5% 0.1W
R 972	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 973	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R 974	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R 975	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R 976	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 977	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 978	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 979	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 980	0103837	CHIP RESISTOR 3300HM+-5% 0.1W
R 981	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R 982	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 983	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R 984	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 985	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 986	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 987	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 988	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 989	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
		RESISTORS
R 990	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 991	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 992	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 993	0103843	CHIP RESISTOR 47KOHM+-5% 0.1W
R 994	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 995	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 996	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 997	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 998	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R 999	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
RM1101	5007942	RESISTOR BLOCK
RM1102	5007944	RESISTOR BLOCK
RT 201	5007434	RESISTOR SEMI VARIABLE 4.7K OHM
RT 202	5007432	RESISTOR SEMI VARIABLE 1K OHM
RT 204	5007441	RESISTOR SEMI VARIABLE 100 OHM
RT 401	5007436	RESISTOR SEMI VARIABLE 22K OHM
RT 402	5007438	RESISTOR SEMI VARIABLE 100K OHM
RT 601	5007452	RESISTOR SEMI VARIABLE 220K OHM
RT 602	5007452	RESISTOR SEMI VARIABLE 220K OHM
RT 603	5007452	RESISTOR SEMI VARIABLE 220K OHM
RT 604	5007452	RESISTOR SEMI VARIABLE 220K OHM
RT 605	5007452	RESISTOR SEMI VARIABLE 220K OHM
RT 901	5007445	RESISTOR SEMI VARIABLE 2.2K OHM
RT 902	5007445	RESISTOR SEMI VARIABLE 2.2K OHM
RT 951	5007532	RESISTOR SEMI VARIABLE 10K OHM
RT1101	5007715	RESISTOR SEMI VARIABLE 10K OHM
RT1102	5007718	RESISTOR SEMI VARIABLE 100K OHM
RT1110	5007468	RESISTOR VARIABLE 1M OHM
RT1111	5007466	RESISTOR SEMI VARIABLE 220K OHM
RT1301	5007438	RESISTOR SEMI VARIABLE 100K OHM
RT1302	5007438	RESISTOR SEMI VARIABLE 100K OHM
RT1401	5007718	RESISTOR SEMI VARIABLE 100K OHM
RT1402	5007714	RESISTOR SEMI VARIABLE 4.7K OHM
RV1601	5027284	VARIABLE 5KOHM
RV1602	5027285	VARIABLE 10KOHM
RT1801	5007715	RESISTOR SEMI VARIABLE 10K OHM
RT1802	5007711	RESISTOR SEMI VARIABLE 470 OHM
RT1803	5007468	RESISTOR VARIABLE 1M OHM
RT1804	5007712	RESISTOR SEMI VARIABLE 1K OHM
RT1805	5007468	RESISTOR VARIABLE 1M OHM
RV 101	5005584	RESISTOR VARIABLE 500K OHM
R1001	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1002	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R1003	0103837	CHIP RESISTOR 330OHM+-5% 0.1W
R1004	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1005	0103839	CHIP RESISTOR 470OHM+-5% 0.1W
R1006	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1007	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1008	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1009	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1010	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1011	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R1012	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1013	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
R1014	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1015	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1016	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1017	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1020	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1021	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1022	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1023	0103841	CHIP RESISTOR 680OHM+-5% 0.1W
R1024	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1026	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1027	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1029	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R1030	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1031	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1032	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1037	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1038	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1039	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1044	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1101	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1102	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1103	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1104	0103840	CHIP RESISTOR 560OHM+-5% 0.1W
R1105	0103828	CHIP RESISTOR 56OHM+-5% 0.1W
R1106	0103828	CHIP RESISTOR 56OHM+-5% 0.1W
R1107	0103828	CHIP RESISTOR 56OHM+-5% 0.1W
R1108	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1109	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1110	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1111	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1112	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1115	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1116	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1117	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1118	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1119	0103828	CHIP RESISTOR 56OHM+-5% 0.1W
R1120	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1121	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1122	0103872	CHIP RESISTOR 270KOHM+-5% 0.1W
R1126	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1127	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R1128	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1130	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R1131	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1132	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1133	0103842	CHIP RESISTOR 820OHM+-5% 0.1W
R1134	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1135	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1136	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1138	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1140	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R1141	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1142	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1143	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1146	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1147	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1150	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1151	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
		RESISTORS
R1152	0103825	CHIP RESISTOR 33OHM+-5% 0.1W
R1153	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1157	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1160	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1161	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1162	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1163	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1165	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1166	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1167	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1168	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1169	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1170	0103841	CHIP RESISTOR 680OHM+-5% 0.1W
R1172	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1173	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1175	0103838	CHIP RESISTOR 390OHM+-5% 0.1W
R1176	0103833	CHIP RESISTOR 150OHM+-5% 0.1W
R1178	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1179	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1150	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1181	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1182	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R1183	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1184	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R1185	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1186	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1187	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1188	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1189	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1191	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1192	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1193	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1194	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1195	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1197	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1301	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1302	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1303	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1304	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1305	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1309	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1310	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1311	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1313	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R1314	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R1315	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R1316	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1317	0103829	CHIP RESISTOR 68OHM+-5% 0.1W
R1318	0103823	CHIP RESISTOR 22OHM+-5% 0.1W
R1319	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1320	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1321	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1322	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1323	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
R1324	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1401	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1402	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1403	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1404	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R1405	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1406	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1407	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R1408	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1409	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1411	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R1412	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1413	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1414	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1415	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1806	0103838	CHIP RESISTOR 390OHM+-5% 0.1W
R1809	0103866	CHIP RESISTOR 82KOHM+-5% 0.1W
R1811	0103866	CHIP RESISTOR 82KOHM+-5% 0.1W
R1812	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1813	0103831	CHIP RESISTOR 100OHM+-5% 0.1W
R1815	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R1816	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1817	0103841	CHIP RESISTOR 680OHM+-5% 0.1W
R1819	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1820	0103881	CHIP RESISTOR 2.2MOHM+-5% 0.1W
R1821	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R1822	0103827	CHIP RESISTOR 470OHM+-5% 0.1W
R1826	0103840	CHIP RESISTOR 560OHM+-5% 0.1W
R1827	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R1836	0103856	CHIP RESISTOR 12KOHM+-5% 0.1W
R1837	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R1838	0103820	CHIP RESISTOR 12 OHM+-5% 1/8W
R1839	0103880	CHIP RESISTOR 1.5MOHM+-5% 0.1W
R1840	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1841	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R1845	0103827	CHIP RESISTOR 470OHM+-5% 0.1W
R1847	0103936	CHIP RESISTOR 270OHM+-5% 0.1W
R1848	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1901	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1902	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1903	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1904	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R1905	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R1906	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1907	0103841	CHIP RESISTOR 680OHM+-5% 0.1W
R1914	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1915	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R1916	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1917	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1918	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R1919	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R1922	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R1923	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R1924	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
		RESISTORS
R1925	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1926	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1927	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
		SEMI-CONDUCTORS
D 050	5328321	DIODE MA151K (MH)
D 051	5328321	DIODE MA151K (MH)
D 052	5328321	DIODE MA151K (MH)
D 080	5381001	LED SLR-34URC5
D 081	5381931	DIODE GL1HD111
D 082	5381931	DIODE "
D 083	5381931	DIODE "
D 084	5381931	DIODE "
D 086	5381931	DIODE "
D 125	5380931	LED GL-450
D 201	5328321	DIODE MA151K (MH)
D 202	5331051	DIODE 1K60P
D 203	5328321	DIODE MA151K (MH)
D 204	5328321	DIODE MA151K (MH)
D 205	5328321	DIODE MA151K (MH)
D 401	5328302	DIODE MA151WA (MN)
D 402	5328381	DIODE MA153 (MC)
D 601	5328303	DIODE MA152WK (MU)
D 602	5328303	DIODE MA152WK (MU)
D 603	5328304	DIODE MA152WA (MO)
D 604	5328321	DIODE MA151K (MH)
D 607	5328303	DIODE MA152WK (MU)
D 608	5328304	DIODE MA152WA (MO)
D 609	5328303	DIODE MA152WK (MU)
D 612	5328304	DIODE MA152WA (MO)
D 613	5328303	DIODE MA152WK (MU)
D 615	5328321	DIODE MA151K (MH)
D 616	5328304	DIODE MA152WA (MO)
D 617	5332151	DIODE DS135D
D 618	5332151	DIODE DS135D
D 619	5328321	DIODE MA151K (MH)
D 620	5328321	DIODE MA151K (MH)
D 623	5328321	DIODE MA151K (MH)
D 625	5328321	DIODE MA151K (MH)
D 626	5328321	DIODE MA151K (MH)
D 630	5332151	DIODE DS135D
D 902	5328303	DIODE MA152WK(MU)
D 905	5328303	DIODE MA152WK(MU)
D 907	5328303	DIODE MA152WK(MU)
D 909	5328303	DIODE MA152WK(MU)
D 910	5328303	DIODE MA152WK(MU)
D 911	5328303	DIODE MA152WK(MU)
D 912	5328303	DIODE MA152WK(MU)
D 913	5328321	DIODE MA151K (MH)
D 914	5328304	DIODE MA152WA(MO)
D 915	5328303	DIODE MA152WK(MU)
D 916	5328303	DIODE MA152WK(MU)
D 918	5328304	DIODE MA152WA (MO)
D 920	5328303	DIODE MA152WK (MU)

SYMBOL-NO	P-NO	DESCRIPTION
D 921	5328303	DIODE MA152WK (MU)
D 922	5328303	DIODE MA152WK (MU)
D 951	5332541	DIODE ERA81-004
D 952	5332541	DIODE ERA81-004
D 953	5328304	DIODE MA152WA(MO)
D 954	5328321	DIODE MA151K (MH)
D 970	5331671	DIODE DS135D-FA3
D1001	5331031	DIODE 1SV68-01
D1101	5330131	DIODE 1S2076 SI 100MHZ 250MW 5NS
D1102	5328321	DIODE MA151K (MH)
D1402	5330131	DIODE 1S2076 SI 100MHZ 250MW 5NS
D1403	5331601	DIODE 1SS99
D1406	5381171	DIODE PD-151
D1801	5331001	DIODE 1SS81
D1802	5328321	DIODE MA151K (MH)
D1803	5381943	LED GL1PG101
IC 201	5370162	IC HT4712A
IC 202	5367121	IC HA11856ANT
IC 203	5367551	IC HA11876NT
IC 204	5373861	IC HT4621
IC 401	5363321	IC BA5112LS
IC 402	5364201	IC UPC1513HA
IC 601	5355892	IC HA11747 BNT
IC 602	5366631	IC BA6303F
IC 603	5366631	IC BA6303F
IC 604	5369911	IC M54548L
IC 605	5355584	IC HA13403
IC 606	5366601	IC BA6305
IC 607	5367241	IC BA728F
IC 608	5368231	IC UPD4013BG
IC 609	5369391	IC MSL9378RS
IC 610	5366561	IC TK19080L
IC 620	5370832	IC HT4496A
IC 901	5362382	IC HD614042FE10
IC 902	5367401	IC MB4204PF
IC 903	5369171	IC M54543L
IC 904	5368711	IC MB89009P-102
IC 905	5364601	IC M5278L-05
IC 906	5366501	IC AN6541
IC 907	5377821	IC HT4422
IC 908	5369552	IC LM393G
IC1002	5370432	IC HT5210A
IC1003	5370432	IC HT5210A
IC1004	5370432	IC HT5210A
IC1005	5370432	IC HT5210A
IC1006	5362341	IC HD62990
IC1101	5370704	R1901C
IC1102	5370685	IC HT5270D
IC1103	5373605	IC HT5272D
IC1104	5370696	IC HT5271E
IC1105	5370696	IC HT5271E
IC1106	5373565	IC HT5452D
IC1107	5383091	IC HT5485
IC1108	5373551	IC HT5266
IC1109	5362981	IC TC40H000F
IC1301	5370713	IC HT5456B

SYMBOL-NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
IC1302	5355401	IC MSM6205GS
IC1401	5364301	IC NJM78M05
IC1402	5370412	IC HT5437A
IC1403	5370001	IC HT5261
IC1404	5359331	IC NJM78L05
IC1601	5370174	IC HT5311C
IC1801	5364742	IC BA7125L
Q 052	5328335	TRANSISTOR 2SB709A-RS-T
Q 053	5328335	TRANSISTOR 2SB709A-RS-T
Q 054	5328971	TRANSISTOR 2SC2412KBRST
Q 055	5328791	TRANSISTOR DTC 124K(25) MICRO PACKAGE
Q 056	5328791	TRANSISTOR DTC 124K(25) MICRO PACKAGE
Q 057	5328791	TRANSISTOR DTC 124K(25) MICRO PACKAGE
Q 101	5328971	TRANSISTOR 2SC2412KBRST
Q 119	5381041	TRANSISTOR NJL5141
Q 123	5380131	TRANSISTOR PH101 PHOTO
Q 124	5380131	TRANSISTOR PH101 PHOTO
Q 126	5382141	TRANSISTOR NJL5161
Q 201	5328335	TRANSISTOR 2SB709A-RS-T
Q 202	5328335	TRANSISTOR 2SB709A-RS-T
Q 203	5328971	TRANSISTOR 2SC2412KBRST
Q 204	5328971	TRANSISTOR 2SC2412KBRST
Q 205	5328971	TRANSISTOR 2SC2412KBRST
Q 206	5328335	TRANSISTOR 2SB709A-RS-T
Q 207	5328793	TRANSISTOR DTC144K-26
Q 208	5328335	TRANSISTOR 2SB709A-RS-T
Q 209	5328793	TRANSISTOR DTC144K-26
Q 210	5328792	TRANSISTOR DTC 124K(15) MICRO PACKAGE
Q 211	5328793	TRANSISTOR DTC144K-26
Q 212	5328971	TRANSISTOR 2SC2412KBRST
Q 213	5328971	TRANSISTOR 2SC2412KBRST
Q 214	5328335	TRANSISTOR 2SB709A-RS-T
Q 215	5328971	TRANSISTOR 2SC2412KBRST
Q 216	5328971	TRANSISTOR 2SC2412KBRST
Q 217	5328971	TRANSISTOR 2SC2412KBRST
Q 218	5328971	TRANSISTOR 2SC2412KBRST
Q 219	5328971	TRANSISTOR 2SC2412KBRST
Q 220	5328793	TRANSISTOR DTC144K-26
Q 221	5328971	TRANSISTOR 2SC2412KBRST
Q 222	5328971	TRANSISTOR 2SC2412KBRST
Q 223	5328793	TRANSISTOR DTC144K-26
Q 224	5328971	TRANSISTOR 2SC2412KBRST
Q 225	5328793	TRANSISTOR DTC144K-26
Q 226	5328793	TRANSISTOR DTC144K-26
Q 227	5328793	TRANSISTOR DTC144K-26
Q 228	5328793	TRANSISTOR DTC144K-26
Q 229	5328971	TRANSISTOR 2SC2412KBRST
Q 230	5328971	TRANSISTOR 2SC2412KR(BR)
Q 231	5328793	TRANSISTOR DTC144K-26
Q 401	5328793	TRANSISTOR DTC144K-26
Q 402	5328971	TRANSISTOR 2SC2412KBRST
Q 404	5328351	TRANSISTOR 2SD602R(WR)
Q 601	5328793	TRANSISTOR DTC144K-26
Q 602	5328793	TRANSISTOR DTC144K-26
Q 603	5328793	TRANSISTOR DTC144K-26

SYMBOL-NO	P-NO	DESCRIPTION
Q 604	5328793	TRANSISTOR DTC144K-26
Q 606	5328793	TRANSISTOR DTC144K-26
Q 607	5328793	TRANSISTOR DTC144K-26
Q 608	5328793	TRANSISTOR DTC144K-26
Q 901	5328971	TRANSISTOR 2SC2412KBRST
Q 902	5328971	TRANSISTOR 2SC2412KBRST
Q 903	5328971	TRANSISTOR 2SC2412KBRST
Q 904	5328335	TRANSISTOR 2SB709A-RS-T
Q 905	5328335	TRANSISTOR 2SB709A-RS-T
Q 906	5328971	TRANSISTOR 2SC2412KBRST
Q 908	5328971	TRANSISTOR 2SC2412KBRST
Q 911	5328335	TRANSISTOR 2SB709A-RS-T
Q 912	5328335	TRANSISTOR 2SB709A-RS-T
Q 913	5328335	TRANSISTOR 2SB709A-RS-T
Q 914	5328971	TRANSISTOR 2SC2412KBRST
Q 915	5328971	TRANSISTOR 2SC2412KBRST
Q 916	5328335	TRANSISTOR 2SB709A-RS-T
Q 917	5328793	TRANSISTOR DTC144K-26
Q 918	5328335	TRANSISTOR 2SB709A-RS-T
Q 919	5328791	TRANSISTOR DTC 124K(25) MICRO PACKAGE
Q 920	5328971	TRANSISTOR 2SC2412KBRST
Q 921	5328795	TRANSISTOR DTA144EK-16
Q 922	5328971	TRANSISTOR 2SC2412KBRST
Q 951	5324081	TRANSISTOR 2SB962
Q 952	5324081	TRANSISTOR 2SB962
Q 953	5328793	TRANSISTOR DTC144K-26
Q 954	5328793	TRANSISTOR DTC144K-26
Q1001	5328333	TRANSISTOR 2SB709A-QR-T
Q1101	5328333	TRANSISTOR 2SB709A-QR-T
Q1102	5328333	TRANSISTOR 2SB709A-QR-T
Q1103	5328042	TRANSISTOR 2SC1623(L6) MICRO PACKAGE
Q1104	5328221	TRANSISTOR 2SC2620-QC MICRO PACKAGE
Q1105	5328333	TRANSISTOR 2SB709A-QR-T
Q1106	5328333	TRANSISTOR 2SB709A-QR-T
Q1107	5328251	TRANSISTOR 2SA1122-CD MICRO PACKAGE
Q1108	5328192	TRANSISTOR 2SC2462-LD MICRO PACKAGE
Q1109	5328251	TRANSISTOR 2SA1122-CD MICRO PACKAGE
Q1110	5328251	TRANSISTOR 2SA1122-CD MICRO PACKAGE
Q1112	5328192	TRANSISTOR 2SC2462-LD MICRO PACKAGE
Q1113	5328794	DIODE DTA143EK-13
Q1114	5328251	TRANSISTOR 2SA1122-CD MICRO PACKAGE
Q1115	5328251	TRANSISTOR 2SA1122-CD MICRO PACKAGE
Q1116	5328251	TRANSISTOR 2SA1122-CD MICRO PACKAGE
Q1301	5328192	TRANSISTOR 2SC2462-LD MICRO PACKAGE
Q1302	5328251	TRANSISTOR 2SA1122-CD MICRO PACKAGE
Q1303	5328042	TRANSISTOR 2SC1623(L6) MICRO PACKAGE
Q1304	5328333	TRANSISTOR 2SB709A-QR-T
Q1305	5328042	TRANSISTOR 2SC1623(L6) MICRO PACKAGE
Q1401	5326272	TRANSISTOR 2SK160(5) (K5)
Q1402	5328791	TRANSISTOR DTC 124K(25) MICRO PACKAGE
Q1404	5328192	TRANSISTOR 2SC2462-LD MICRO PACKAGE
Q1405	5328192	TRANSISTOR 2SC2462-LD MICRO PACKAGE
Q1406	5323906	TRANSISTOR 2SC1740
Q1407	5328201	TRANSISTOR 2SC2618(RC)
Q1408	5328201	TRANSISTOR 2SC2618(RC)
Q1410	5328792	TRANSISTOR DTC 124K(15) MICRO PACKAGE

SYMBOL-NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
Q1801	5320211	TRANSISTOR 2SA1121C(ISC)
Q1802	5328241	TRANSISTOR 2SC2463E(DE)
Q1803	5321831	TRANSISTOR 2SD974
ZD 901	5330525	DIODE HZ9A2 SI ZENER 1MHZ 0.4W
ZD 902	5331596	DIODE RD3.6E-B2
ZD 903	5331277	DIODE HZ7B-3
ZD 904	5331277	DIODE HZ7B-3
ZD 905	5331277	DIODE HZ7B-3
ZD1405	5331268	DIODE HZ-6B-3L
ZD1407	5328662	DIODE MA3068
		TRANSFORMERS
T 401	5261282	OSC COIL
T1801	5271811	FLYBACK TRANSFORMAR
		COILS
L 201	5152612	CHOKE COIL 220MICRO H
L 202	5152596	CHOKE COIL 15UH
L 203	5152607	CHOKE COIL 100MICRO H
L 204	5152601	CHOKE COIL 33UH
L 205	5152606	CHOKE COIL 82UH+-10%
L 206	5152607	CHOKE COIL 100MICRO H
L 207	5152349	CHOKE COIL 820UH
L 209	5152607	CHOKE COIL 100MICRO H
L 210	5152617	CHOKE COIL 0.47UH+-20%
L 211	5152617	CHOKE COIL 0.47UH+-20%
L 212	5152607	CHOKE COIL 100MICRO H
L 213	5152617	CHOKE COIL 0.47UH+-20%
L 214	5152607	CHOKE COIL 100MICRO H
L 215	5152617	CHOKE COIL 0.47UH+-20%
L 216	5152607	CHOKE COIL 100MICRO H
L 217	5152615	CHOKE COIL 390UH+-10%
L 218	5152607	CHOKE COIL 100MICRO H
L 219	5152607	CHOKE COIL 100MICRO H
L 221	5152607	CHOKE COIL 100MICRO H
L 224	5152598	CHOKE COIL 22UH+-10%
L 226	5152607	CHOKE COIL 100MICRO H
L 227	5152596	CHOKE COIL 15UH
L 228	5152597	CHOKE COIL 18UH
L 230	5152603	CHOKE COIL 47UH
L 233	5152607	CHOKE COIL 100MICRO H
L 234	5152612	CHOKE COIL 220MICRO H
L 235	5152595	CHOKE COIL 12UH
L 401	5152815	CHOKE COIL 22MH+-5%
L 402	5152623	CHOKE COIL 15000MICRO H
L 403	5152346	CHOKE COIL 470UH+-10%
L 601	5152603	CHOKE COIL 47UH
L 951	5152751	CHOKE COIL 120UH+-10%
L 952	5152752	CHOKE COIL 50UH+-10%
L 953	5152752	CHOKE COIL 50UH+-10%
L 954	5152943	CHOKE COIL 390UH+-10%
L1001	5152607	CHOKE COIL 100MICRO H
L1101	5152607	CHOKE COIL 100MICRO H
L1102	5152607	CHOKE COIL 100MICRO H

SYMBOL-NO	P-NO	DESCRIPTION
L1103	5152595	CHOKE COIL 12UH
L1201	5152612	CHOKE COIL 220MICRO H
L1302	5152596	CHOKE COIL 15UH
L1303	5152596	CHOKE COIL 15UH
L1401	5152607	CHOKE COIL 100MICRO H
L1801	5152589	CHOKE COIL 4.7UH+-10%
L1802	5152612	CHOKE COIL 220MICRO H
L1804	5270574	COIL
L1805	5152603	CHOKE COIL 47UH
		CRYSTALS
X 201	5781672	CRYSTAL
X1301	5780711	CRYSTAL
X1401	5781491	XTAL
		MISCELLANEOUS
CP 201	5124131	TRAP COIL
CP 202	5162961	FILTER
CP 203	5162892	DELAY LINE
CP1101	5163014	LOW PASS FILTER
CP1102	5162203	TRAP COIL
CX 901	5781121	XTAL
DL 201	5785861	DELAY LINE
DL 202	5785871	DELAY LINE
DL1100	5162865	LOW PASS FILTER
DL1101	5162933	LOW PASS FILTER
DL1102	5162873	LOW PASS FILTER
DL1103	5163032	DELAY LINE
DL1301	5163071	HIGH PASS FILTER
F 970	5721221	FUSE
J 101	5673791	ST JACK
J 401	5673781	JACK
J 970	5674341	DC JACK
RL 901	5641901	RELAY
S 050	5622811	SLIDE SWITCH
S 051	5635133	SWITCH
S 052	5635133	SWITCH
S 053	5635133	SWITCH
S 054	5635133	SWITCH
S 055	5635133	SWITCH
S 056	5633911	SWITCH
S 057	5633911	SWITCH
S 060	5633911	SWITCH
S 061	5633911	SWITCH
S 062	5633911	SWITCH
S 121	5635221	PUSH SWITCH
S 122	5635221	PUSH SWITCH
SW1601	5622424	SWITCH
SW1602	5622424	SWITCH
SW1603	5633911	SWITCH
SW1604	5633672	SWITCH
SW1605	5635035	SWITCH
SW1606	5635035	SWITCH
SW1607	5633911	SWITCH
SW1608	5633911	SWITCH
SW1609	5633911	SWITCH
SW1610	5633911	SWITCH

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
101	6085994	FUNCTION BUTTON ASSEMBLY
102	6077123	POWER KNOB
103	6027721	SIDE COVER ASSEMBLY (R)
104	6085821	BUTTON
105	6084931	BUTTON
106	5967821	BATT TERMINAL ASSEMBLY
107	6188953	COVER
108	6335752	HAND STRAP
109	6892751	BOTTOM FRAME
110	6077131	KNOB
111	6086001	COUNTER BUTTON
112	6077004	SLIDE KNOB
113	6077012	KNOB
114	6027711	SIDE COVER ASSEMBLY (L)
115	6889227	LOCK LEVER
116	6082687	BUTTON-RELEASE
117	6189883	SLIDE DOOR
118	7393721	ACCESARY SHOE
119	7369212	EVF SHOE
120	6539542	SPRING
121	6175875	CASSETTE LID ASSEMBLY
122	8741404	SCREW TUNER MOUNTING
123	6893141	HOOD CAP
124	6592611	CAP
125	6175223	GRIP COVER
126	6890911	CAP
127	7749782	SHEET
129	6175532	BATTERY COVER
131	6175521	DATE COVER
132	6892902	LED HOLDER
161	5509072	LENS HOOD
162	5509073	LENS
163	5509074	COVER
164	5509075	MOTOR
165	5509076	IRIS BLOCK
166	5509077	LENS-REAR BLOCK
167	5509078	HOLDER
168	5509088	TOP COVER
169	5509085	AF BUTTON
170	5509083	END SWITCH
171	5509079	SHIELD CASE
172	5509082	CBA
173	5509086	AF MOTOR
181	5509095	SCREW
182	5509096	SCREW
183	5509097	SCREW
184	5509098	SCREW
185	5509099	SCREW
186	5509101	SCREW
187	5509102	SCREW
188	5509103	SCREW
189	5509104	SCREW
202	6894471	REEL DISK-SUPPLY
203	6887716	REEL DISK-TAKE-UP

SYMBOL-NO	P-NO	DESCRIPTION
204	6888263	SUB BRAKE
205	6544711	SPRING
206	6979911	PRESSURE ROLLER ARM
207	7392882	PRESSURE ROLLER ARM
208	6544726	SPRING
209	6544762	SPRING
210	6979805	BEARING
211	6888933	SUB BRAKE
212	6544755	SPRING
213	6974642	POLE ARM
214	6550813	SPRING
215	6888867	HOLDER
216	7392925	TENTION ARM
217	6979945	ARM
218	7368001	TENSION BAND
219	7393582	SPRING STOPPER
220	6544736	SPRING
221	6888964	HOLDER
222	5575781	MOTOR
223	6344952	IMPEDANCE ROLLER
224	4503434	FLANGE
225	6522391	SPRING
226	6888342	FULL ERASE HEAD BASE
227	5447761	FELL ERASE HEAD
228	6550781	SPRING
229	7393015	ARM
230	7392983	PLATE
231	6888531	GUIDE ROLLER
232	4504421	SLEEVE
233	4504012	FLANGE
234	4504461	TAPE GUIDE
235	6522432	SPRING
236	7785621	NUT
237	7777505	FLYWHEEL HOLDER
238	6550791	SPRING
239	5446271	AUDIO CONTROL HEAD
240	6539041	HEAD SPRING
241	6522441	SPRING
242	7787031	THRUST SUPPORT
243	6750441	RETAINER
245	6974861	CACHER
246	5792925	BRUSH
247	6979895	GUIDE ROLLER BASE(O)
248	7392783	PLATE
249	6979836	GUIDE ROLLER BASE
250	7394151	PLATE
251	4503404	GUIDE ROLLER
252	6979962	ARM
253	6888802	ARM
254	6539052	SPRING
255	6979973	STOPPER
256	6888574	RAIL
257	7392736	LOADING LINK I
258	7392773	LOADING LINK (O)
259	0170263	DEW SENSOR
260	6888983	LED HOLDER

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
261	6077063	WHEEL
262	6889271	JACK HOLDER
263	6892241	HOLDER
264	6889172	HOLDER
266	7748252	BELT COVER
267	6889292	HINGE
268	6887462	C.B.A HOLDER
270	6539182	SPRING
271	6890221	OIL SHEEL
273	4503406	GUIDE ROLLER
289	7789841	POLY SLIDER WASHER
301	7031872	GEAR BLOCK
302	6375071	FLYHEEL
303	6358012	BELT
304	6356441	BELT
305	6356443	BELT
306	7392803	GEAR
307	7392793	GEAR
308	6889047	ARM
309	7393054	SLIDER
310	6889034	PR ARM ASSEMBBLY
311	7398241	SLIDER
312	6434661	GEAR
313	6888753	HOLDER
314	6888793	CAM GEAR
315	5612612	SWITCH
316	6888552	FUNCTION ARM
317	7393073	GEAR PLATE
318	7392761	SLIDER
319	6550942	SPRING
320	6544783	SPRING
321	6344633	DUMPER
322	5578751	LODING MOTOR
401	7367922	CASSETTE HOLDER ASSEMBLY
402	6889028	LOCK HOLDER
403	6888603	HOLDER
404	6888952	HOLDER
501	5459651	UPPER CYLINDER
502	5459662	LOWER CYLINDER
601	6956224	LENS
602	5781643	FILTER
603	7454812	SHIELD CASE
604	6592731	RUBBER
606	8691306	BT SCREW 2.6MM
607	6520321	SPRING
608	7782142	SCREW
609	8812231	WASHER - 2MMD
610	7454582	SHIELD COVER
611	6892413	FRAME
612	6892791	FRAME
613	8691308	BT SCREW-2.6MMDX8MM
614	6189871	GRIP COVER
615	0724306	SCREW 2.6x6
616	8691308	BT SCREW-2.6MMDX8MM
617	6892392	HOLDER
618	8691308	BT SCREW-2.6MMDX8MM
619	5884861	CONNECTOR-EVF
621	8741405	SCREW - 3MMD X 5MM BIND
623	7367893	AF BRACKET
624	6892821	CBA HOLDER
625	6894001	CBA HOLDER
626	6869312	COVER
627	6893153	BATTERY HOLDER
630	7454563	SHIELD
701	6025613	UPPER CASE
703	6887751	UPPER NACK
704	6955931	LENS
705	6082512	BUTTON
706	6592292	CAP
707	6894041	CRT COVER
708	6539171	SPRING
709	6890131	HOLDER
710	7393831	BRACKET
711	6592122	RUBBER
712	6889951	COVER
713	6536115	SPRING
714	6693123	MIRROR
715	6888651	LEVER HOLDER
716	6887721	BUTTON LEVER
717	6082521	SLIDE BUTTON
718	6026002	BOTTOM CASE
719	6889982	BOTTOM PIECE
720	6592422	HOLDER
721	6887732	SHOE PIECE
722	6889573	LOCK PIECE
723	6890004	BOTTOM PIECE
724	5311451	CRT
725	5271865	DEFELECTION COIL
726	5855214	EVF CABLE
727	5672442	JACK
728	5422322	MICROPHONE
730	6539241	SPRING
732	5654454	CRT SOCKET
901	8691106	DT SCREW-2MMDX6MM
902	8691306	BT SCREW 2.6MM
903	8699106	SCREW
904	0724306	SCREW(2.6 x 6)
905	8699308	BT BIND SCREW-2 6MMDX8MM(BRACK)
906	7784371	SCREW
907	0741304	BIND SCREW 2.6MMDX4MM
931	8699305	SCREW (2.6X5)
932	8711108	PAN HEAD SCREW-2MMDX8MM
933	7781582	FALT SCREW-3MMDX10MM (BLACK)
934	8699308	BT BIND SCREW-2 6MMDX8MM(BRACK)
941	7787535	WASHER
942	7778859	POLYSLIDER WASHER
943	8741108	BIND SCREW 2X8
944	7230901	E RING FOR SPRING MOUNTING
946	7778847	POLY SLIDER WASHER
947	8741105	BIND SCREW FOR PLATE SPRING MOUNTING
948	7778859	POLYSLIDER WASHER
949	7787615	POLY-SLIDER WASHER

SYMBOL-NO	P-NO	DESCRIPTION
		FOR FINAL ASSEMBLY
950	8741103	SCREW(2X3B)
951	8650105	SCREW (2X5)
952	8691108	SCREW(2X8)
953	8741103	SCREW(2X3B)
954	7788901	POLY-SLIDER WASHER
955	8741103	SCREW(2X3B)
956	7788901	POLY-SLIDER WASHER
957	8619001	SCREW (BT1.7X3)
958	8741104	BIND SCREW 2MMDX4MM
959	8691105	SCREW
960	8741103	SCREW(2X3B)
961	7785183	NUT
962	8741104	BIND SCREW 2MMDX4MM
963	7787615	POLY-SLIDER WASHER
964	7780901	SCREW (1.7X4)
965	8741105	BIND SCREW FOR PLATE SPRING MOUNTING
966	8741106	BIND SCREW-2MMDX6MM
967	8741104	BIND SCREW 2MMDX4MM
968	8741106	BIND SCREW-2MMDX6MM
969	8741106	BIND SCREW-2MMDX6MM
970	7780905	SCREW (1.7X6)
971	7780905	SCREW (1.7X6)
972	8691106	DT SCREW-2MMDX6MM
973	7787615	POLY-SLIDER WASHER
974	8741106	BIND SCREW-2MMDX6MM
975	8741104	BIND SCREW 2MMDX4MM
976	7230901	E RING FOR SPRING MOUNTING
977	7788623	PLATE
978	7230901	E RING FOR SPRING MOUNTING
979	8811113	WASHER 2.6MMD 2REQ'D
980	8650105	SCREW (2X5)
981	8741103	SCREW(2X3B)
982	8691106	DT SCREW-2MMDX6MM
983	8741105	BIND SCREW FOR PLATE SPRING MOUNTING
984	8741110	BIND SCREW-2MMDX 10MM
985	7789931	WASHER
987	8741109	SCREW
988	7780902	PAN HEAD SCREW-1.7MMDX2MM
989	7780902	PAN HEAD SCREW-1.7MMDX2MM
990	8741104	BIND SCREW 2MMDX4MM
992	8741106	BIND SCREW-2MMDX6MM
994	7784371	SCREW
995	8741106	BIND SCREW-2MMDX6MM
996	7782611	SCREW
997	7778855	POLYSLIDER WASHER
		FOR ACCESSARIES
801	4651931	OPERATING GUIDE
802	6335793	HANDLE
803	6335782	SHOULDER STRAP
804	7032363	AC ADAPTER
805	7095042	RF CONVERTOR UNIT
806	5855321	ADAPTER CABLE
807	5687871	300-75OHM VHF ANTENNA ADAPTER
808	5747903	CORD
809	5855401	AV PIN CORD
810	5659991	AV ADAPTOR
811	5731013	EARPHONE
812	7097271	BATTERY PACK
		FOR CHASSIS ASSEMBL
001	5929801	MAIN CBA
002	5470211	FSH PCB ASSEMBLY
003	5968233	EVF PCB ASSEMBLY
004	5959924	SENSOR CBA
005	5928314	PROCESS PCB ASSEMBLY
006	5928296	ENCODER CBA
007	5928201	WIRING PCB ASSEMBLY
008	5928171	CONTROL PCB ASSEMBLY
009	5927571	AUDIO CBA
010	5968191	END LAMP CBA
011	5968192	SUPPLY END SENSOR CBA
012	5968193	TAKE-UP END SENSOR CBA
013	5968198	REEL SENSOR CBA
014	5968195	SAFETY TAB SWITCH CBA
015	5968196	CASSETTE HOLDER SWITCH CBA
016	5470011	SUPPLY REEL SENSOR CBA

HITACHI SALES CORPORATION OF AMERICA
Eastern Regional Office
1290 Wall Street West, Lyndhurst, New Jersey 07071, U.S.A.
Tel. 201-935-8980

Mid-Western Regional Office
1400 Morse Ave., Elk Grove Village, Ill. 60007, U.S.A.
Tel. 312-593-1550

Southern Regional Office
510 Plaza Drive, College Park, Georgia 30349, U.S.A.
Tel. 404-763-0360

Western Regional Office
401 West Artesia Boulevard, Compton, California 90220 U.S.A.
Tel. 213-537-8383

HITACHI SALES CORPORATION OF HAWAII. INC.
3219 Koapaka Street. Honolulu, Hawaii 96819, U.S.A.
Tel. 808-836-3621

HITACHI (HSC) CANADA INC.
3300 Trans-Canada Highway, Pointe Claire, Quebec,
H9R 1B1, Canada
Tel. 514-697-9150

Hitachi Sales Centroamericana, S.A.
San Rafael de Escazu, (Apartado 10272), San Jose,
Costa Rica
Tel. 28-2011, 28-0037

Hitachi Sales Corporation de Panama, S.A.
Nuevo Reparto el Carmen, Calle Ramon Arias y Calle B
Edificio Brasil 100, (Apartado 7657) Panama 5
Panama City, Rep. of Panama
Tel. 61-3100, 61-4305

Hitachi Sales de Chile Cia., Ltda.
Av. Mexico, 0183, Casilla 9793, Correo Central
Santiago, Chile
Tel. 774165

HITACHI Ltd. TOKYO JAPAN
Head Office: THE HITACHI ATAGO BLDG.
No. 15-12, 2-Chome Nishi-Shinbashi
Minato-Ku, Tokyo 105, Japan
Tel. Tokyo (03) 502-2111

HITACHI

VM-5000A TK No. 2464E TOKAI

Printed in Japan (K)